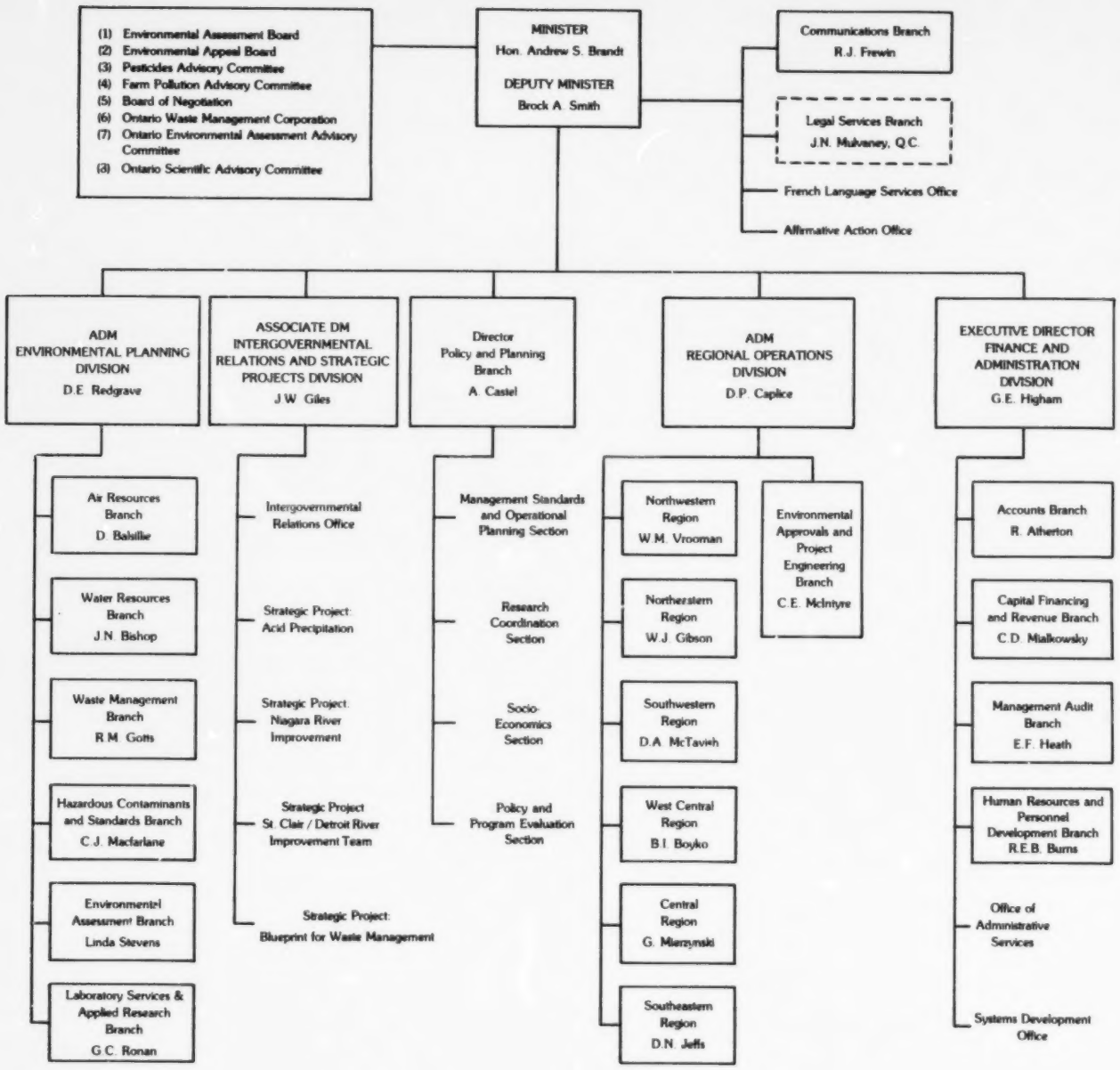
Annual Report
1982 - 1983

Ontario

Ministry
of the
Environment

85-4633/

MINISTRY OF THE ENVIRONMENT 1984*



*For Organization Chart, 1983 see inside back cover

contents

Organization Chart ..... **Inside Front Cover**
Letters of Transmittal 2
Minister's Message 3

Deputy Minister **7**
Policy and Planning Branch 7
Legal Services Branch 8
Communications Branch 8
French Language Services Office 10
Affirmative Action Office 10

Intergovernmental Relations and Strategic Projects Division **11**
Intergovernmental Relations Office 11
Acid Precipitation 11
Niagara River Improvement 12
Emergency Response Co-ordination Office 13
Blueprint for Waste Management 13

Environmental Planning Division **15**
Air Resources Branch 15
Water Resources Branch 18
Waste Management Branch 22
Hazardous Contaminants and Standards Branch 24
Environmental Assessment Branch 25
Laboratory Services and Applied Research Branch 26

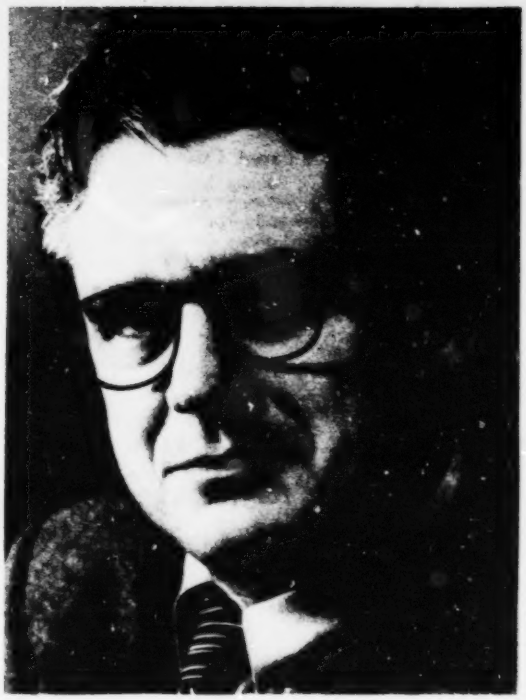
Regional Operations Division **31**
Northwestern Region 33
Northeastern Region 34
Southwestern Region 36
West Central Region 39
Central Region 41
Southeastern Region 43
Environmental Approvals and Project Engineering Branch 45
Special Investigation Unit 48

Finance and Administration Division **51**
Accounts Branch 51
Capital Financing and Revenue Branch 51
Management Audit Branch 52
Human Resources and Personnel Development Branch 52
Office of Administrative Services 53
Systems Development Office 53

Boards and Committees **55**
Environmental Assessment Board 55
Environmental Appeal Board 56
Pesticides Advisory Committee 56
Farm Pollution Advisory Committee 56

Crown Agency **57**
Ontario Waste Management Corporation 57

Appendices - Charts and Tables **59**
Capital Construction Program 59



To:

The Honourable
Andrew S. Brandt
Minister

Sir,

I have the honour to submit for your approval the annual report of the Ministry of the Environment for the year 1982/83

Respectfully submitted,

Brock A. Smith
Deputy Minister

To:

His Honour,
The Lieutenant-Governor
of the Province of Ontario.

May it Please Your Honour,

I have the privilege to present the annual report of the Ministry of the Environment for the fiscal year beginning April 1, 1982 and ending March 31, 1983.

Respectfully submitted,

Andrew S. Brandt
Minister

Minister's Message

I am privileged to present this report on Environment Ontario's activities during the fiscal year 1982/83. These activities of the regions, head office and the laboratories speak for the achievements of each.

Since my appointment, I have had the opportunity to tour a number of locations throughout the province where we have special programs under way, and have talked with concerned residents as well as with my staff who are dealing with these specific challenges.

I have also had a chance to meet with the executives of major environmental groups, municipal leaders, representatives from the industrial sector and with environmental officials of other jurisdictions in both Canada and the United States.

In preparing myself, I have learned extensively by direct contact and discussions with the operating staff of the Ministry in our regional offices and in our technical branches at head office as well as with our laboratory scientists in Rexdale. In all instances, I have been impressed by the quality and dedication of the people working in the Ministry.

During 1982/83, the Ministry underwent a major restructuring to meet future-oriented challenges of the '80s, which was a main event of the year.

Our perception of environmental dangers has changed markedly since the late '70s. Earlier, we were mainly concerned with the control and clean-up of pollutants that we could see or smell or were unsanitary. Great progress was made in treatment of municipal sewage including removal of phosphorus, sanitary landfilling of municipal garbage, and abatement of industrial discharges to air and water.

Today, we are challenged by new and more insidious environmental problems uncovered by new scientific knowledge including great improvements in analytical methods

— acid rain, for example, and newly discovered toxic contaminants in waterways and former landfill sites. The solution of these new problems has called for better co-ordination both internally and with other levels of government.

Our reorganization was undertaken to improve internal co-ordination and to improve the Ministry's ability to react quickly to:

- Deal effectively with the minuscule amounts of potentially dangerous material newly detected by vastly improved analytical techniques.
- Deal effectively with damages caused by the long range transport of pollutants across international boundaries.
- Continue its successful fight against traditional forms of water, air and land pollution.
- Improve the use of public participation in the development of environmental standards and conservation/recycling practices.

Since the creation in 1956 of the Ontario Water Resources Commission, now incorporated into the Ministry, the province has expanded its environmental legislation and gained a world-wide reputation for its policies and initiatives to preserve and protect its natural environment.

Advances have been made in many areas, including the following highlighted achievements and current initiatives:

- The air quality of major cities throughout the province has substantially improved as a result of Ministry abatement activities, despite growth and industrial development.
- More than 95 per cent of Ontario residents are now served by water and sewage treatment plants and enjoy an abundant supply of good, safe drinking water.
- Solid wastes are now disposed of in an environmentally acceptable manner and we are seeking the means of reducing our dependency on landfill by improved recycling methods of technology.
- The Ontario Waste Management Corporation has been established as a Crown agency to develop and manage facilities which will meet Ontario's long-term liquid and hazardous industrial waste treatment and disposal needs.
- Rapid strides have been made in the scientific field as our knowledge and detection capabilities have expanded dramatically. Environment Ontario today has one of the best analytical laboratories in North America.
- A Hazardous Contaminants and Standards Branch has been established within the Ministry to set standards for chemicals and their management for the maximum protection of human health and the environment.
- To address the world-wide need for information on the significance of trace contaminants now being detected, the province is also supporting, along with the federal government and private industry, the establishment of an independent Centre for Toxicology, building on current programs of the University of Toronto and Guelph University.
- Ontario's unique Sport Fish Testing and Public Information Program, which began by telling the public the exact situation with regard to contaminants in sport fish, is now able to demonstrate the results of decisive pollution control action.
- Through the Ministry's Acidic Precipitation in Ontario Study, we have been able to pinpoint sources of pollution and make a contribution toward world-wide scientific understanding and acknowledgement of the acid rain problem.
- Through the establishment of the Niagara River Improvement Team, to monitor contaminants from U.S. chemical disposal sites which threaten Lake Ontario drinking water, we have assumed an active role with our federal government in demanding pollution clean-up in New York State.

There is no doubt that acid rain, the Niagara River and chemical contaminants are major threats to our environment. These issues are indicative of the new concerns facing the Ministry in the '80s. Therefore, more resources are being channeled to cope with the new forms of pollution, to assess risks, and to deliver regulatory programs where required.

Because of transboundary pollution, we must also endeavor to obtain much more expeditious and concerted abatement action from our southern neighbors.

Ministry scientists have conclusive evidence that 50 to 70 per cent of the acid rain damage to Ontario's ecosystem stems from sulphur and nitrogen pollution caused by electrical utility and industrial emissions in the region of the Ohio Valley. We also have conclusive evidence that approximately 95 per cent of the pollution in the Niagara River originates from chemical complexes and disposal sites on the U.S. side of the river. Furthermore, U.S. scientific bodies agree with our assessments.

Ontario, therefore, has no other course but to continue to intervene through legal devices in concert with our federal government in U.S. appellate courts and tribunals about pollution adversely affecting the province's natural environment.

During the past several years, through public relations programs and its Legal Services Branch, Environment Ontario has made considerable headway in terms of raising public consciousness and awareness in the United States concerning these critical issues.

As earlier stated, our new areas of environmental concern are associated mainly with chemicals, the consequence of our heavy industrialization and consumer-oriented lifestyle.

Approximately 70,000 industrial chemicals are used in our industrial society around the Great Lakes basin, including 2,800 which are commonly used. These figures do not include the hundreds of thousands of compounds formed as byproducts of the manufacturing processes, and during disposal in chemical dumps and in incinerators. Many of these are known or suspected to be toxic.

Ontario has set standards for air and water pollution for over two decades. However, most jurisdictions have set standards for only a small handful of environmental contaminants. This is true of the vast organizations to which we often look

for guidance, such as the World Health Organization and the Environmental Protection Agency of the United States.

Ontario has taken an important step to marshal the knowledge we need in dealing more effectively with chemicals in the environment. We are the first Canadian province to establish a special branch to deal exclusively with hazardous contaminants and standards. Backed up by a substantial allocation of resources, the Ministry is already meeting the challenge by working with specialists in other ministries of the Ontario Government and with its counterparts in the Federal Government.

The Hazardous Contaminants and Standards Branch was established in the summer of 1982 to co-ordinate development of plans and programs for the control of hazardous contaminants in the environment and to establish standards for the protection of public health and the environment. The development of these standards as they relate to human health will take into account the exposure of Ontario citizens to hazardous contaminants from all sources — air, water, diet and physical environment.

Many of these contaminants have been in the environment for decades, but were not identifiable. Today, the Ministry measures some contaminants in parts per trillion — a million times more sensitive than detection levels of ten years ago. In fact, environmental scientists have at their disposal analytical methods capable of detecting substances in the part per quadrillion concentration. That is equivalent to a decimal point with 15 zeros after it.

Therefore, it is not surprising that the public is confused by this recent phenomenon which has been labelled "the tyranny of numbers."

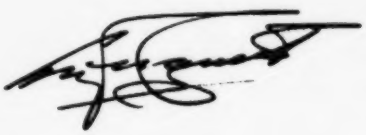
It is said that environmental scientists are excited with the astonishing sensitivity of their sleuthing toys. Medical authorities are overwhelmed with the mountainous array of data indicating infinitesimal quantities of compounds for which there is a world-wide knowledge gap on human effects.

The public, in turn, is bound to be bewildered and confused with the conflicting interpretations being placed on the health significance of these data. Meanwhile, the news media often carry stories with unscientific and sensational approaches to this data, which only succeeds in arousing unnecessary anxiety in the minds of readers and listeners.

Environment Ontario is doing its best to keep abreast of world-wide developments in environmental protection — and frequently taking a lead in development initiatives. There is no other jurisdiction I know of in North America or elsewhere that has put in place such a broad and full range of programs to preserve and protect its environment.

I will want to put my own stamp on new programs and policies as we progress through new scientific knowledge, the development of new technology programs and control orders as required.

An overview of Environment Ontario's ongoing programs and emerging activities to meet new challenges is outlined in this report under the various divisions and branches of the Ministry. Reorganization is also indicated under each division.



Andrew S. Brandt
Minister

deputy minister

Deputy Minister — Brock A. Smith
Executive Assistant — Mark McKenney

Policy and Planning Branch

Director: André Castel

The role of the Policy and Planning Branch is to identify the broad program and resource needs of the Ministry and to co-ordinate the effective management and efficient utilisation of Ministry resources. There are four main areas of responsibility.

1. The branch analyzes Ministry policies and programs, co-ordinates policy development, and provides liaison with the government's central agencies. In 1982/83, 16 new policies were analyzed and approved. Twenty-five submissions to the Cabinet Committee on Resources Development were prepared including legislative amendments to the Ontario Water Resources Act and the Environmental Protection Act. Two submissions were made to the Cabinet Committee on Administered Prices.

2. The branch develops and maintains the Ministry's strategic and operational planning systems and is responsible for the co-ordination, development and application of improved management processes. In 1982/83, a corporate strategic planning process was developed, and the Ministry's operational planning process was formalized. The Ministry's Management-by-Results (MBR) system was improved to provide better information for assessing current and future environmental needs and for evaluating the accomplishments of ongoing Ministry programs. Moreover, a management improvement plan was submitted to Management Board, and working groups for operational planning, long range planning and management reporting were established.

3. The branch provides socio-economic analysis of proposed environmental policies and undertakings. In 1982/83, the branch continued to assist in the Ministry's efforts in studying acid rain and developing approaches for its control. A computerized linear programming screening model was developed to enable determination of least-cost abatement strategies for achieving desired levels of acid deposition within or among jurisdictions. In addition, the branch undertook social and economic analyses of proposed environmental policy options in the areas of waste management, environmental standards and pollution control.

4. The branch co-ordinates the identification of research priorities, the allocation of resources to research, and the evaluation of research performance. During 1982/83, the Ministry's formal research planning process was developed and implemented. The branch also produced the Research Advisory Committee annual report and a report on Ministry research accomplishments.

Legal Services Branch

Director: J. N. Mulvaney, Q.C.

During 1982/83, staff of the Legal Services Branch:

- Handled 65 prosecutions before the courts, 36 of which were initiated during the fiscal year.
- Participated as counsel in two lengthy hearings under the Consolidated Hearings Act concerning undertakings by Ontario Hydro.
- Prepared extensive amendments to the Environmental Protection Act and the Ontario Water Resources Act.
- Took part in interventions in U.S. administrative proceedings concerning transboundary pollution with respect to acid rain and Niagara River issues.
- Assisted in the implementation of a summary system of enforcement for minor prosecutions in accordance with the Provincial Offences Act.

Communications Branch

Director: R.J. Frewin

Activities of the Communications Branch support current programs and new initiatives of the Ministry.

The branch provides communication and public information services aimed at keeping the public informed of Ministry policies and activities. During the year, the branch produced and distributed 82 news releases, 50 speeches and statements, and a wide range of publications, reports, newsletters and printed and audio-visual educational materials. It answered thousands of public enquiries by telephone and mail, created exhibits for fairs and arranged seminars, hearings and meetings as part of the Ministry's extensive public participation program.

Acid Rain

Since the inception of the Acidic Precipitation in Ontario Study (APIOS) program, the branch has provided support by initiating communications and educational activities in order to inform the public in Ontario and the United States about the Ministry's scientific, abatement, socio-economic and legal initiatives in this high profile environmental issue.

This support during 1982/83 included these activities.

- An update of the brochure entitled The Case Against the Rain. More than 70,000 copies have been distributed here and from Canadian consulate offices in the U.S. and our Washington embassy since 1981.
- An update of the 18-minute videotape, The Case Against the Rain. The 27-minute documentary, Crisis in the Rain, won a Gold Camera award at the U.S. Industrial Film Festival in Chicago. This film has been viewed on screen and TV by an estimated audience of 17 million persons in Canada and the U.S.
- An acid rain exhibit package was created for province-wide use.
- Open houses were held in Parry Sound and Sundridge, at the Kortright Conservation Centre near Kleinburg, and at the Ministry's Acid Rain Research Centre in Dorset.
- Tours for U.S. legislators, Congressmen and news media, co-hosted by the Ministry, Environment Canada and the Department of External Affairs, continued to describe the Canadian perspective on acid rain to U.S. participants, and received coverage in major U.S. print and broadcast media.

Special Projects

- The branch again assisted the Ontario Federation of Anglers and Hunters in staging its third annual Pitch-In campaign to clean up rivers, streams, shorelines, trails and back-roads. Approximately 1,000 groups participated, cleaning up hundreds of tons of litter and junk.
- For the fourth year, in Operation Skywatch, women pilots flew volunteer environmental patrols along the shorelines of the Ottawa River, St.

Lawrence River and the Great Lakes. Skywatch is a joint venture of the Ministry and the Ninety-Nines Inc., the international organization of women pilots. The branch maintains regular liaison with Ministry regional co-ordinators of Skywatch, who provide the pilots with film and equipment and direction for the patrols.

- The branch worked with the Waste Management Branch to introduce the Blueprint for Waste Management program and the supportive public participation program. The information program included 20 seminars in cities across the province to obtain public suggestions and participation.
- The 30th Ontario Industrial Waste Conference, co-ordinated by the branch for the Ministry, was attended by 611 delegates, the highest registration in the conference history.
- In view of growing public concern about the cleanup of the Great Lakes under auspices of the International Joint Commission, and the ongoing Canada-United States and Canada-Ontario water quality agreements, the branch published a booklet entitled The Great Lakes: Yesterday, Today and Tomorrow as part of the Ministry's 10-year celebration.

Exhibits

Displays were set up for National Environment Week in June at Toronto City Hall, Ontario Place and Kingston. Two display programs were produced to communicate the efforts of Environment Ontario and the South Lake Simcoe Conservation Authority in controlling phosphorus loadings to Lake Simcoe, which were exhibited at the Barrie Agricultural Fair and other centres in the region. Acid rain exhibits were staged in shopping malls, fairs and open houses. A display was provided for the Francophone Centre at Harbourfront, Toronto.

French Publications

Many of the Ministry's major publications and approximately 75 per cent of information fact sheets are now available in French, as well as educational environmental lesson sets for francophone teachers.

Films

Fifteen Ministry films were used in more than 1,800 showings before a total Ontario audience of 64,415. In addition, nine films including Crisis in the Rain were booked for 92 showings on television to an audience estimated at 3.5 million to Canada, and a larger audience in the U.S.

Ontario's Fish Testing and Information Program

For the fifth year, the bilingual publication Guide to Eating Ontario Sport Fish was published in April 1982. Designed to provide the angler and consumer with information on possible trace contaminants such as mercury, PCB, mirex and DDT in sport fish, these guides contain test data on more than 75,000 fish collected from 1,200 rivers, lakes and areas of the Great Lakes. More than 180,000 copies were distributed free via government offices and by Brewers Retail and LCBO outlets in vacation areas.

Quarterly News Magazine

Environment Ontario's Legacy published a special issue in July to celebrate the Ministry's 10th anniversary. A second special issue was published in January to report on the Ministry's corporate reorganization. The magazine is distributed to libraries, schools and environmental groups and to many individuals among its circulation of approximately 22,000.

Education

Under the Ministry's Environmental Explorations Program, eight university students employed during the summer visited 330 schools, resident camps and provincial parks across Ontario. The program, which runs for 16 weeks each summer, is designed to promote an interest in and concern for our environment and to provide information to students and adults. About 80,000 people attended the workshops during 1982/83.

For the sixth year, the Ministry sponsored an environmental workshop for more than 50 special and outdoor education teachers at the Bolton Conference Centre, incorporating an integration of practical field studies and classroom applications.

Library Services

The Library Services Section, consisting of both the main library at 135 St. Clair Avenue West in Toronto and the laboratory library in Rexdale, serves Ministry staff and the public.

During the year, the section responded to 9,363 reference questions, lent 9,415 books, and processed 77,084 photocopies of information material. It acquired 2,575 technical books and documents, subscribed to 199 journals which were widely circulated throughout the Ministry, conducted 658 computer searches for scientific material, and acquired 4,118 U.S. government documents on microfilm.

The growing need to automate the libraries was recognized and staff conducted an extensive review of library needs, computer systems, and other libraries that were automated. Automation will be introduced during 1984/85.

French Language Services

Co-ordinator: N. Vakharia

Highlights included:

- The Environmental Assessment Board developed and implemented a policy on French language services ensuring bilingual public hearings.
- A review of existing forms and documents established priorities for translation. The translation is underway.
- "FAITS: Environnement Ontario — Services" was developed to accommodate requests for information in French. This fact sheet lists professional/technical personnel capable of assisting French-speaking residents.
- A lexicon on environmental terminology was developed to assist Ministry staff in providing services in French.
- A central fund of $20,000 continued to provide French language training for 47 Ministry staff members. A special course, Le Francais de l'accueil, was developed to improve telephone and reception services to the public in French.
- Direction Jeunesse received a grant of $5,000 to organize Week-End Environment, a three-day training session on environmental issues.

Affirmative Action Office

Affirmative Action
Program Manager: A. M. Clark

In 1982/83, 26 women participated in career development initiatives of which 12 were on developmental assignments of three months or more. For the first time the largest number of participants and largest amount of staff training and development dollars were in the technical/professional courses.

Teleconferencing and monthly meetings were held with regional and head office representatives of the Ministry's Women's Advisory Committee. Newsletters were published, and counselling sessions held with interested staff.

The program sponsored a second Career Development Assessment Centre for six females and six males from the scientific, resource management and environmental technician areas of the Ministry. The centre evaluated five management skills in order to identify employees with management potential. The results will be used to help develop career plans. The Ministry also hired women to fill several positions not previously filled by women.

intergovernmental relations and strategic projects division

Associate Deputy Minister: J. W. Giles

This division co-ordinates the Ministry's approach to designated critical issues and to intergovernmental activities.

It also assists in the development of the Ministry's position to resolve pollution problems shared with national and international jurisdictions and develops bilateral and multilateral agreements in support of ongoing control strategies.

The division is composed of:

- *the Intergovernmental Relations Office*
- *the Acid Precipitation Project*
- *the Niagara River Improvement Project*
- *the Emergency Response Co-ordination Office*
- *the Blueprint for Waste Management*

Intergovernmental Relations Office

Environmental and
Technical Advisor: W. A. Steggles

The Intergovernmental Relations Office provides advice respecting the Province's environmental policies and programs and their co-ordination with those of other governments. Activities include negotiation of intergovernmental agreements and supervision of their implementation as they relate to resource development and air and water pollution.

The Canada-Ontario Accord on Environmental Protection and the Great Lakes Water Quality Agreement are examples which require co-ordination of U.S. and Canadian activities in co-operation with the branches and regions of the Ministry and other Ontario government ministries and agencies.

Acidic Precipitation

Co-ordinator: E. W. Piché

Since 1979, when the Acidic Precipitation in Ontario Study (APIOS) was established to investigate acid rain and the long range transport of air pollutants, an extensive multi-disciplinary program has been developed to investigate cause/effect relationships and to explore possible options for abatement. During the fiscal year more than $8 million was spent on this program, which is carried out in several branches of the

Ministry under the co-ordination of the APIOS office.

In 1982/83, the statistical model, previously developed by Ministry scientists to estimate total deposition of sulphur throughout the province, was expanded to include oxides of nitrogen (NO_x).

The monthly and event deposition monitoring networks continued to monitor wet and dry deposition, airborne particulate matter and gaseous sulphur and nitrogen. While the monthly or cumulative network will help determine acid loadings in various areas, the daily event network will aid in defining more accurately specific source/receptor relationships.

Aquatic, terrestrial and socio-economic studies continued throughout the year, gathering data on which abatement policies can be based.

Much of this research work is conducted at and around the Ministry's research centre at Dorset, Haliburton County, located in the centre of one of the province's most sensitive areas.

This centre is located at the heart of 32 watersheds, including eight lakes, calibrated by APIOS. During the year, staff took thousands of samples of soil, water, rain and snow and measured them for their pH value and other chemical and physical properties.

Ontario has also taken major steps to reduce its own contribution to the acid rain problem.

In August 1980, the Ministry issued a regulation to Inco Limited in Sudbury limiting its SO_2 emissions to 2,500 tons per day, effective the date of the regulation, and to 1,950 per day by December 31, 1982. These reductions were accomplished on schedule.

In February 1981, the Ministry issued a regulation for the reduction of sulphur dioxide and nitrogen oxide emissions from Ontario Hydro's thermal electric stations. Essentially, this regulation will result in a 43 per cent reduction in emissions by 1990.

Regulations and/or control orders for other sources of SO_2 and NO_x are under review.

Ontario has been working closely with the federal government and other provincial governments, as well as with scientists in other nations, to examine the problem and to propose various abatement strategies.

However, without a commitment from the United States, Ontario cannot win the fight against acid rain. For this reason, the Ministry has been involved in a series of legal interventions in the United States, which commenced in March 1981 in proceedings before the United States courts and the Environmental Protection Agency.

On June 30, 1982, the province intervened at a public hearing of the Michigan Air Pollution Control Commission in opposition to the Detroit Edison request to delay bringing its Monroe power plant into compliance with the Michigan "1% or equivalent sulphur in fuel rule". Ontario was represented at the July 20, 1982 meeting where the commission decided not to grant the request. At its November 29, 1982 meeting, the commission considered a 1.9% sulphur in fuel limit for the Monroe plant. Again, Ontario submitted a statement recommending compliance with the 1% sulphur in fuel rule. The commission ultimately rejected the 1.9% option as well.

In February 1983, Ontario submitted a letter to the Indiana Air Pollution Control Board in opposition to a proposed sulphur dioxide emissions limit increase from 6 lbs. of SO_2/MMBTU to 7.11 lbs. for the Indianapolis Power and Light generating station in Pike County. The control board approved the company's request but has not yet officially submitted it to the U.S. Environmental Protection Agency as a State Implementation Plan (SIP).

To ensure timely intervention in SIP relaxations of concern, the Ministry has asked Canadian consulates in the U.S. for early notification of proposed relaxations.

Legal Services Branch staff, in conjunction with the staff of several U.S. legal firms, as well as staff of the Ontario Attorney General's Ministry, are reviewing various legal avenues open to the province in the U.S., including:

- Continued interventions at the state level under Section 110 (State Implementation Plan Revisions) of the U.S. Clean Air Act.
- Possible legal suits under Sections 126 and 115 of the U.S. Clean Air Act.

Niagara River Improvement Program

Co-ordinator: P.J. Crabtree

In order to better concentrate Ontario's efforts to reduce the discharge of contaminants to the Niagara River from Canadian and United States sources, and to stimulate corrective action, the Niagara River Improvement Team was formed in November 1981.

In Ontario, the team has been re-evaluating the quality of effluents from industrial and municipal sources that discharge into the Niagara and Welland rivers, in terms of the toxic organics and metals they may contain. In addition, surface and subsurface waters adjacent to landfill sites have been sampled and analyzed. The results of this work, and recommendations for further appropriate control programs, are expected to be published in the fall of 1984.

The team is also looking closely at all significant sources of pollution on the New York State side of the Niagara River.

Reviews are being conducted of State Pollution Discharge Elimination System permits for major industrial and municipal discharges that contribute about 95 per cent of the point source contamination from the U.S. side. Following these reviews, the team submits comments and suggestions for changes to the New York State Department of Environmental Conservation. If the team considers that a public airing of the issues and concerns related to a particular permit is needed, it may ask for a hearing.

The team evaluates waste disposal sites in New York that pose major threats to the Niagara River. These include the Love Canal, Hyde Park, S-Area, 102 Street and Occidental Petroleum's Niagara plant property, all of which are the subject of litigation in state or federal courts. In each case, the team's first step is to carry out a technical evaluation. Subsequent action depends on the situation, and varies from monitoring remedial work to seeking intervenor status in court proceedings.

In addition to the inactive waste disposal sites, the team reviews appli-

cations for new landfill facilities. In particular, the team has looked at proposals by the SCA Company for expansion of its operations at Model City, and has expressed its views at several public hearings.

The team is represented on the international Niagara River Toxics Committee, which comprises scientists and engineers representing federal, state and provincial environmental agencies in the U.S. and Canada. Its terms of reference are to identify the sources and chemical nature of all inputs of contaminants to the river, and attempt to quantify individual chemical substances.

The committee will also make recommendations for control programs beyond those already in place, and for a long-term monitoring program for the river. It will be reporting in the fall of 1984.

Emergency Response Co-ordination Office

Co-ordinator: G. H. Kay

The Ministry's primary role in spill incidents is that of a regulatory body enforcing the provisions of the Environmental Protection Act.

The Emergency Response Co-ordination Office maintains and updates the Province of Ontario Contingency Plan for Spills of Oil and Other Hazardous Materials.

In 1982/83, staff of this office:

- Assessed the Ministry's role and preparedness for spills and other emergencies.
- Prepared the 1982 spill reports summary.
- Revised and updated the Ontario contingency plan.
- Worked with other ministries on the Transportation of Dangerous Goods Act and regulations and the Emergency Plans Act.
- Continued development of Part IX of the act and regulations.
- Assisted in efforts to provide a field communications system serving the province.
- Produced training aids.
- Processed reports from regional staff on 482 spills
- Worked with governments and industry on contingency planning and response.
- Participated in the Associate Deputy Minister's review of the Ministry's Emergency Response capability.

Blueprint for Waste Management

Co-ordinator: T. D. Armstrong

In November 1982, the Hon. Keith Norton announced the preparation of a discussion paper entitled "Blueprint for Waste Management" to be prepared by June 1983. He invited the public to submit ideas for improving waste management in Ontario. Numerous and varied public contacts were made as the Blueprint was prepared. Municipalities, industries, interest groups and individuals were involved.

Also in late 1982, six people were assigned to compile a field inventory of approximately 1,400 certified active waste disposal sites, reviewing each on the basis of a standardized format. By the end of the fiscal year, most of the waste sites in Southern Ontario had been inspected.

environmental planning division

Assistant Deputy Minister:
D. E. Redgrave

This division is responsible for developing plans, programs and policies: to provide technical and scientific expertise and support to Regional operations in the conduct of field monitoring site investigation and prosecutions; to protect air quality; to protect surface and ground water quality and quantity; to manage wastes; to ensure an adequate quality of drinking water; and to promote the consideration of the environment in the planning and the development of undertakings.

The Division consists of:
Air Resources Branch
Water Resources Branch
Waste Management Branch
Hazardous Contaminants and Standards Branch
Environmental Assessment Branch
Laboratory Services and Applied Research

Air Resources Branch

Director: G. Van Volkenburgh

This branch develops all proposed policies, programs, standards, guidelines, legislation and regulations for the protection and enhancement of ambient air quality in the province.

It provides support and advisory service to the Ministry for emission control as well as other ministries, agencies and the public.

Air Quality and Meteorology Section

This section maintains the data base and telemetering system of Ontario's air quality monitoring network, which in 1982/83 constituted 1,250 instruments located in 125 areas.

The network produced approximately 3 million measurements, which are computer-processed. The measurements consist of the levels of 12 contaminants as well as meteorological parameters.

The section also develops and applies mathematical models to compute the quality of air and dry and wet deposition (acidic precipitation) of contaminants.

The contracted development of a complex acid deposition and oxidant air-monitoring model, sponsored by the Ministry in partnership with Environment Canada and the West German Government, is reviewed by this Section.

The Ontario Air Pollution Index, the basis for the Ontario Alert System, continued to be monitored and publicized daily for Windsor, Sarnia, Hamilton, Niagara Falls, Toronto, Sudbury, Coniston, New Sudbury and St. Catharines.

Atmospheric Research and Special Programs

The monitoring and instrumentation development unit monitors air quality in special surveys and during emergency response procedures using mobile facilities. It also develops and evaluates instrumentation to measure concentrations of non-routine air pollutants, especially organic vapors.

The special studies unit is responsible for the co-ordination of activities under the Nanticoke Environmental Management Program and for carrying out the atmospheric chemistry and deposition (wet and dry) monitoring program for the Acidic Precipitation in Ontario Study.

The atmospheric contaminants and research planning unit co-ordinates branch activities related to hazardous contaminants and contributes to the development of a priority list of hazardous chemicals and a handbook of environmental contaminants. This unit has also been active in the evaluation of measurement methods for inhalable particulate matter, organic vapors, and poly-nuclear aromatic hydrocarbons. The unit administers the air research working group which plans and recommends internal and external research projects related to air pollution. This includes funding to Ontario universities.

Emission Technology and Regulations Development Section

This section is composed of four units — regulations development and environmental assessment, control and process technology, source testing and vehicle emissions.

Regulations Development and Environmental Assessment Unit

During the year, the unit established five guidelines for new air contaminants and issued comments on air quality in 10 environmental assessments. Staff played a major

Extensive Air Monitoring Surveys, 1982/83

Compounds	Locations	Source
Organic compounds	Mississauga	St. Lawrence Cement
Sulphur dioxide	Sudbury	Falconbridge Nickel Mines Ltd.
Organic compounds	Elmira	Uniroyal Ltd.
Odors	Toronto	Meat packing plants
Odors	Toronto	Continental Can
Sulphur dioxide Reduced sulphur compounds, Hydrocarbons	Breslau	Breslube Enterprises
Fluoride and odors	Dunnville	International Minerals and Chemical Corporation
Organic compounds	Simcoe	Canada Wire and Cable
Reduced sulphur compounds and hydrocarbons	Nanticoke	Stelco
Reduced sulphur compounds, Particulate, chlorine and chlorine dioxide, hydrocarbons	Fort Frances	Boise Cascade Canada Ltd.
Organic compounds and ammonia	Sault Ste. Marie	Domtar
Sulphur dioxide	Toronto	Anacheia Ltd.
Hydrocarbons and chlorinated hydrocarbons	Woodstock	Cement Lafarge
Phenol	Cambridge	Becher Lay Tech
Organic compounds	Toronto	Signode

role in preparing the Ministry submission and participation at the public hearing regarding the proposed energy-from-waste installation at Victoria Hospital, London.

Staff also assisted in the development of Ontario's position concerning the federal proposal for the reduction in standards for new-car emissions of carbon monoxide, total hydrocarbons and nitrogen oxides.

Standard methods for the sampling and analysis of 14 compounds in ambient air were developed.

Staff developed a new impulse vibration standard for regulating vibration complaints, and revised 11 technical publications supporting the Model Municipal Noise Control Bylaw.

In Ontario, 125 municipalities have now adopted a noise control bylaw under Section 138 of the Environmental Protection Act. Twenty applications for certificates of approval and 17 environmental assessment documents were reviewed for potential noise impact. Staff provided testimony or consulting services at four Ontario Municipal Board hearings and in four legal actions.

In co-operation with land-use planning assessment unit, staff investigated 170 noise and vibration complaints.

Eight seminars and courses in acoustic technology for 140 participants were given to municipal and provincial government staffs. Staff also participated in the work of research advisory committees at provincial and federal levels, and in the work of standard writing bodies such as the Canadian Standards Association. International Organization for Standardization, and International Electrotechnical Commission.

Vehicle Emissions Unit

During the year, 5,036 cars in 22 locations were checked for emission controls and exhaust emission levels. Of these, 52 per cent failed to meet Ontario standards and their operators were requested to have the problems corrected. Ten per cent had pollution control equipment inoperative or disconnected and were issued violation notices.

A total of 3,084 cars were inspected at 317 used-car dealerships and 124 violation notices were issued. Visits were made to 425 muffler shops to ensure proper replacement of catalytic mufflers. Also, 785 gas stations were checked to ensure that leaded gasoline is not dispensed to catalyst-equipped vehicles. Incorrect dispensing nozzles were noticed in 151 stations.

Highway patrols in co-operation with the Ontario Provincial Police have been continued and resulted in 422 diesel trucks being stopped for excessive smoke emissions: 386 charges were issued and 36 warnings; 370 operators were found guilty and fined, 12 cases were dismissed and four are pending.

Staff made 30 visits to community colleges to explain Ministry control programs and provisions of the Environmental Protection Act to 2,520 student mechanics.

Source Measurement Unit

The unit continued acting as a project co-ordinator for the Ministry's program on dioxin emissions from combusion sources. In 1982/83 measurements at three municipal incinerators were completed, a provisional guideline on air concentrations of dioxins and furans was issued and emissions from the measured incinerators were assessed in terms of the guideline provisions.

Staff also initiated work on construction of an emissions monitoring van, co-ordinated source testing at the Texaco refinery in Nanticoke and oversaw compliance source testing programs.

Control and Process Technology Unit

The unit participated in developing the Ontario/Canada Task Force report on the non-ferrous smelting industry, evaluating consultants' studies and cost surveys, and reviewing drafts of the report.

A survey was conducted of Ontario petroleum refineries in order to assess their potential for reducing emissions of sulphur dioxide, and the costs involved. In addition, the ability of the refineries to reduce the sulphur content of fuel oils was examined in connection with the possible need for curtailing emissions of sulphur dioxide from smaller combustion sources.

The unit also continued to provide information on emission control technologies to various branches and programs of the Ministry.

Phytotoxicology Section

The section conducted soil and vegetation assessment studies near 94 industrial and other sources and investigated 181 vegetation complaints in which air pollution was suspected of causing damage.

Twenty-nine per cent of the 181 complaints investigated were diagnosed as being caused by contaminants and 38 involved possible economic losses, with reports provided to the board of negotiation in the event claims of damage were made.

During the 1982 crop-growing season phytotoxicology staff conducted extensive field assessment surveys to determine the degree of ozone injury on white-bean, potato and tomato crops throughout southwestern Ontario. Oxidant injury to crops was about the same as found in 1981, with 1981 and 1982 ratings being well below the highest rating found during 1976.

More than 30 complaints about suspected lead contamination of garden soil and vegetables in the vicinity of a secondary lead smelter were investigated in 1982. In all cases, concentrations were well below the level at which soil replacement was recommended.

Mercury levels in vegetables were found to be excessive in both 1981 and 1982 on properties downwind of a chloralkali plant in Cornwall. An experiment is under way to assess the pathway of mercury into the vegetables, either from contaminated soil or company emissions.

Surveys continued on Cornwall Island to document the degree of fluoride injury to vegetation resulting from emissions from aluminum smelters in New York State on the south side of the St. Lawrence River. There has been a significant reduction in the amount of damage on Cornwall Island compared to the

early 1970s as a result of abatement actions by the companies. However, some effects occur annually with little change having been noted in 1982 compared to the previous year. The phytotoxicology data will be used in a lawsuit initiated by the St. Regis Indian Band.

Experiments were conducted in 1982 at the Ministry's controlled environment facility at Brampton. A study was conducted to determine if contaminated soil from Fighting Island, near Windsor, could be treated to support vegetation. The addition of peat moss plus fertilizer was found to promote satisfactory growth of grasses on the chalky spoil material composed principally of gypsum and lime.

A mobile overhead canopy system is being built to study the effects of acid rain on field-grown crops.

Water Resources Branch

Director: D. N Jeffs

As part of the Ministry's reorganization, the municipal and private section of the disbanded Pollution Control Branch was transferred to the Water Resources Branch. A first priority of this unit will be to review and update existing drinking water objectives.

Water Management

Working Group I (Water Quality Objectives and Criteria) of the water management steering committee was reorganized. As its first task, the group developed a procedure for adding to or revising the provincial water quality objectives. Chlorophenols and chlorobenzenes were reviewed and proposed objectives were developed for each of the constituents of these groups. Peer reviews of the findings were initiated in the spring of 1983.

Staff continued to co-ordinate and participate in the activities of several Ministry committees and working groups, such as the water management steering committee, the groundwater liaison committee, the landfill gas committee, the Maple (Keele Valley) landfill committee, the technical steering committee — Uniroyal Site, Elmira, the Salford landfill committee and the waste management site support team.

Staff participated in inter-agency liaison activities, including the Canada-Ontario hydrometric cost-share agreement co-ordinating committee, the erosion and sedimentation committee, the Canadian advisory committee on remote sensing and the nonpoint source control task force of the International Joint Commission.

During the year, 459 water well drilling and boring licences were issued and 20 contractors licenced for the first time. Prosecutions against three drillers on seven charges were successful. Renewal of one licence was refused and this refusal was upheld at a hearing of the Environmental Appeal Board. A total of 7,341 water-well records were received and processed.

As part of a provincial ground water quality network, intensive monthly sampling began at 26 well sites to monitor background groundwater quality conditions and to identify the nature of quality fluctuations and long-term trends. As well, planning was initiated on the development of a specific groundwater network to monitor and identify trends in background levels of trace contaminants in groundwater.

Water Resource Inventories

A report on the water resources of the Holland and Black river basins was published. Results from a water resources inventory of the upper portions of the Etobicoke Creek, Mimico Creek, Humber River and Don River basins were assembled for publication. Field work and data compilation were completed for the Credit River basin study.

Water resources data (1981) for streamflow, water quality and observation well monitoring networks were assembled for publication. Groundwater well information obtained from licensed drilling and boring contractors was released in two publications in the groundwater series. Reports on groundwater quality fluctuations and streamflow variability in agricultural lands were published.

A biological monitoring component was added to the provincial water quality monitoring network to investigate inorganic and organic trace contaminant levels in young-of-the-year fish.

The groundwater mapping program continued with the publication of two groundwater probability maps and the completion of data assessment and/or cartography for an additional three. Five groundwater susceptibility maps were published and data compilation was completed for an additional 14.

Engineering, Scientific and Data Services

Geophysical surveys involving seismic, resistivity, gravity, well logging and magnetometer techniques were undertaken to assist in the investigation of several groundwater contamination problems, groundwater development projects, hydrogeological investigations for waste disposal sites, and the location of buried metal containers.

Groundwater surveys and general reviews of groundwater potential were undertaken for eight municipalities. Ten test-drilling and well construction projects to develop municipal water supplies were supervised. Groundwater interference problems were investigated for four municipal projects. Technical assistance was provided for five private services funding projects.

Reviews of groundwater contamination potential were undertaken for 18 landfill and waste sites. Staff completed a review and prepared a detailed submission for the Environmental Appeal Board on York Sanitation Landfill No. 4. Extensive assistance on this subject was provided to the Legal Services Branch, the Environmental Approvals Branch, the Environmental Hearing Board, and the Project Engineering Branch. Staff reviewed hydrogeological evidence presented at the consolidated hearing board for the Oxford County landfill site and prepared a submission to Cabinet.

Great Lakes (tributaries) Program

Total phosphorus loading estimates (1981/82) for significant tributaries in the Canadian Great Lakes drainage basin were provided for the 1982 Water Quality Board report of the International Joint Commission. Enhanced monitoring at 17 significant Great Lakes tributaries was initiated to improve the precision of tributary loading estimates.

Hazardous Contaminants and Sport Fish

The Water Resources Branch, through its Hazardous Contaminants Unit continued its information series on potential organic and inorganic pollutants. Environment and health data, such as physical/chemical properties, aquatic environmental pathways and fate, and toxicity, are routinely circulated to Ministry staff dealing with the aquatic environment. Individual technical assistance is also provided for specific investigations at the request of regional and head office staff.

The Hazardous Contaminants Unit co-ordinates the sport fish collection and testing program, a co-operative effort between this branch and the Laboratory Services and Applied Research Branch, and the Ministry of Natural Resources. Fish from lakes and rivers throughout Ontario are tested for a variety of organic and inorganic substances including mercury, PCB, mirex, DDT and 2,3,7,8-TCDD (dioxin).

The fifth annual edition of Guide to Eating Ontario Sport Fish was published in a substantially revised format with a new section on dioxin and a fish identification chart. Information on fish species from 1,100 locations was set forth to assist anglers in determining the suitability of eating the fish that they caught. The new or updated information was published in five environmental health bulletins.

Lakeshore Capacity Study

The summary report was completed for the Lakeshore capacity study trophic status component. This project was designed to aid in assessment of the effects of current and future proposals for shoreline development of Ontario's recreational lakes. Research studies were carried out, over the period 1976/1980, on lakes and streams selected to exhibit a range of development and trophic status. Studies of many of these lakes and streams are continuing under the APIOS program. Effects of development on the study lakes were evaluated and a step-by-step method was developed for predicting development effects on lake trophic status.

Grand River Study

The final report of the Grand River basin water management study was released and was followed by a series of public meetings. Through a questionnaire, basin municipalities were encouraged to provide their reaction to the report's recommendations. In general, reaction was favorable. The results will be presented to the Provincial Government.

Sudbury Environmental Study

The final limnological report on studies of seven acidic lakes in the Sudbury area was completed. The program spanned 1973 to 1980 and included investigations of atmospheric and watershed inputs to the lakes, lake chemistry, biota and sediments. Experimental neutralization and fertilization of lakes were carried out. Mass balance models, using the chemical data, demonstrated that 50 to 85 per cent of the total deposition (dependent on distance from smelting operations) was the result of dry deposition of sulphur dioxide which is largely of local origin. Acidification rates of the experimentally treated lakes were also calculated. Effective treatment was as short as two years and depended on the rate of supply of strong acid to the lakes.

Acidic Precipitation in Ontario Study (APIOS)

Staff continued intensive sampling and analysis of the eight major study lakes near Dorset and their 31 associated sub-watersheds. The intent is to quantify the physical, chemical and biological effects of acidic inputs to lakes and eventually to construct models enabling prediction of both effects and acceptable loading rates of acid-forming materials. Methods to determine the speciation of aluminum in water were developed and applied in conjunction with pH toxicity testing of fish and amphibiana.

International involvement in acidic precipitation research was continued. Presentations of the Ministry's results were made at the 10-year anniversary Man and Environment conference in Stockholm. Staff took part in the evaluation of research investigative programs in the U.S. Dr. J. Galloway, an atmospheric deposition expert, spent part of the year working with APIOS, and numerous specialists from across Canada and the U.S. have done studies over the year with Dorset Research Centre personnel.

An inventory of 135 private, domestic groundwater supplies between North Bay and Timmins was completed, and an inventory of the effects of acidic lake waters on domestic plumbing systems in the Sudbury area was started. Groundwater quantity and quality studies in the APIOS calibrated watersheds near Dorset continued with extensive sampling of groundwaters and the installation of piezometers and observation wells.

Two progress reports on groundwater quality studies on domestic drinking waters in the Muskoka/Haliburton and Sudbury areas were published.

Stratford-Avon River Environmental Management Project

In this three-year study, information was assembled on water quality, aquatic plants and algae, hydrology and pollutant loadings from sewage treatment plants, industrial discharges and agricultural areas. Demonstration projects of remedial measures were initiated in-stream and in the urban and rural areas.

Forty-two technical reports were prepared. The final report is under review.

Toronto Area Watershed Management Strategy Study

Activities relating to the Toronto area watershed management stragegy study began in 1981. The Ministry is conducting the project in co-operation with the Metropolitan Toronto and Region Conservation Authority, Metropolitan Toronto and the cities and boroughs within Metropolitan Toronto. During the first year, staff compiled existing sources of data on water quality and pollution control systems and collected additional data needed to fill major gaps in the data base. Staff are currently involved in the third year of the study, with emphasis on the Humber River.

Lake Simcoe Environmental Management Strategy Study

These studies conducted by the Ministry and the South Lake Simcoe Conservation Authority continued for the second year. Activities related primarily to identifying the sources of diffuse phosphorus loadings, their magnitude and significance, and investigating methods of reducing them. Construction of the water monitoring stations was completed and nutrients and flow data were collected on streams flowing into Lake Simcoe. Treatability studies on pump-off waters from the Holland Marsh were conducted and rating curves developed for the pumping stations. Agricultural land use data were compiled and studies initiated to prepare erosion sensitivity mapping of the Lake Simcoe basin.

The Lake Simcoe monitoring program was continued and a special study was conducted on phosphorus regeneration in the lower Holland River.

Water Supply and Pollution Control

The fourth revised edition of the Ontario drinking water objectives and the accompanying policy statement were completed. The revised objectives, subsequently approved and put into effect in April 1983, become the primary document governing the management of drinking water quality in Ontario. More criteria, particularly on hazardous contaminants, are being set as part of an ongoing program. A comprehensive sampling program to monitor and assess plant compliance with the drinking water objectives on a provincial basis is under development.

An information package on fluoridation was prepared in co-operation with representatives from medical officers of health, Ministry of Health and the Canadian Dental Association. The information package was sent to medical officers of health and waterworks authorities with controlled fluoridation programs. During a period of fluoridation chemical shortages, staff provided advice on matters dealing with fluoridation interruption.

Staff continued to serve on committees and panels, made presentations and informed news media about subjects related to maintenance of safe drinking water. Special activities included the evaluation of piping materials and 17 commercial products for acceptance and use as treatment chemicals, paints, coatings or linings in contact with potable water.

Assistance was given to local public health agencies in organizing their survey of public bathing beaches. Advice was also provided on private water supply problems.

Guidelines on selection and location of cemetery sites for the protection of water supply sources were completed and published for distribution to regional offices and public health units. Staff conducted health unit seminars on private water and bathing beaches and assisted in the planning of a seminar on environmental health aspects of spills for the Ontario Public Health Association.

Assistance was also provided to the regions and local health units on the acceptability of particular home water treatment devices.

In the area of municipal wastewater control, policies and guidelines have been developed and implemented to specify effluent requirements and to facilitate their incorporation into certificates of approval for municipal and private sewage works where appropriate. Implementation of these policies and guidelines tightens the control of municipal and private sewage works discharges.

To expedite the implementation of the effluent compliance enforcement program, TUMMIS (Total Utility Monitoring and Management Information System) has been developed and is now operational. This system will store effluent data for wastewater facilities, and automatically assess the plants' compliance with specified effluent requirements.

Monitoring and evaluation of phosphorus removal at wastewater treatment plants was continued. In 1982, 241 wastewater treatment plants with phosphorus removal facilities removed an estimated 8,500 tonnes of phosphorus which would otherwise have been discharged to lakes and rivers.

A status report on the pollution abatement efforts of Great Lakes municipalities in Ontario was forwarded to the International Joint Commission for inclusion in the IJC Water Quality Board annual report.

Development of the Ontario urban drainage management program, co-ordinated by the municipal sewage unit, has moved into the final phase. The intergovernmental urban drainage policy implementation committee (consisting of representatives from the ministries of the Environment, Municipal Affairs and Housing, Natural Resources, and Transportation and Communications, and from the Municipal Engineers Association and the conservation authorities) has completed a draft policy and guidelines implementation package. Its implementation will ensure quantity and quality control of urban

drainage where necessary, and in the most cost-effective and consistent manner.

In addition to co-ordinating federal/provincial efforts in determining sewage treatment process efficiencies in removal of selected hazardous contaminants, as well as in characterization of sewage treatment plant effluents and urban runoff, staff also initiated an industrial sewer-use control review program aimed at improving the capabilities of municipalities when dealing with hazardous contaminant discharges.

Great Lakes Section Program

The Great Lakes program is a federal/provincial cost-shared surveillance, investigation and assessment program providing data and information required for defining aquatic environmental conditions and trends in nearshore areas and connecting channels of the Great Lakes. It determines the effectiveness of pollution abatement measures necessary to restore and maintain water quality in accordance with provincial water quality objectives and the objectives of the Canada/U.S. Agreement of 1978.

Ministry surveillance programs, along with the programs of other environmental and regulatory agencies around the Great Lakes, are rapidly adding to our knowledge of the distribution of many contaminants such as heavy metals, pesticides, herbicides, organochlorines, and other hazardous organic contaminants. The following are the highlights of the Ministry's surveillance activities in 1982/83 on a lake-by-lake basis.

Lake Superior

The water quality of Lake Superior, including the nearshore areas, is generally satisfactory and the lake can be considered to be oligotrophic. Problems, where they exist, are confined to areas near large urban centres and industrial operations related to pulp and paper mills. Surveillance work in 1982/83 concentrated on extending the 1981/82 pulp and paper mill investigations to other areas, as a further preliminary assessment of water quality conditions in nearshore areas. These assessments also provided the background for the development of more intensive studies of Lake Superior as part of Great Lakes international surveillance plan for 1983/84.

Specifically, studies in Jackfish Bay in 1981 provided information on guidelines for toxic contaminants for use in a control order issued in 1982 for the Kimberly-Clark mill. An assessment of water quality in Thunder Bay and the characterization of effluents from seven mills discharging to Thunder Bay, Nipigon Bay, Jackfish Bay and Lake Superior, provided a baseline for future evaluation of the aquatic environment in nearshore areas. In addition, an inventory of trace contaminant constituents of pulp and paper mill effluents was established for use in formulating effluent guidelines and issuance of control orders.

Lake Huron

The water quality in Lake Huron is satisfactory with the exception of isolated nearshore areas of Saginaw Bay on the U.S. side. The lake can be considered to be oligotrophic. On the Canadian side, problem areas are confined to the St. Marys River and certain harbors and embayments such as Penetang and Midland. Analysis and reporting of activities of the 1980/81 Lake Huron intensive year study was continued.

Monitoring of the impact of the Great Lakes Power Ltd. redevelopment project on St. Marys River water quality was continued. No adverse effects have resulted. The studies provided information relevant to the need for further remedial measures at Algoma Steel Ltd. and at the Abitibi-Price paper mill. A control order was issued to Algoma Steel to limit discharges of phenol, ammonia, cyanide and hydrogen sulphide which in turn should eliminate transboundary pollution in the St. Marys River.

Investigations for the proposed westerly sewage treatment plant for the City of Sault Ste. Marie were initiated.

Lake Erie

Because Lake Erie has the smallest volume of all the Great Lakes and the largest population around it, water is susceptible to the effects of nutrient enrichment.

Studies focused on the distribution of nutrients and algae in the western basin and the establishment of a baseline for the Grand River mouth area to assess the impact of future development in the Grand River watershed. Total phosphorus levels along the Ontario shoreline of the western basin were well within the Ministry's guideline (20 ug/L), indicating a significant decline during the last decade. The study to determine the impact of industrial development at Nanticoke was continued and reports for the period 1969/1978 were drafted.

Studies were initiated in the St. Clair River to determine the effectiveness of remedial measures undertaken at industrial sources in the Sarnia area to reduce phenols and organics. Total phenol levels in 1982 were generally in compliance with the provincial objective. In addition, the extension of the Township Ditch should alleviate the impact on nearshore waters and will eliminate the overlap of phenols from multiple sources along the shore.

Bacteriological studies along the Ontario shoreline of the Detroit River indicate levels above the Ministry's objective for recreational uses. Several remedial measures, which included sewer separation and the expansion of the Little River and Windsor sewage treatment plants, were started as a result. Studies are under way to expand the Amherstburg sewage treatment plant.

Lake Ontario

The presence of various toxic contaminants can be considered to be the major concern of recent environmental studies. The major source of these contaminants is the Niagara River and its numerous dump sites and chemical facilities on the United States side. Studies and investigations on the Niagara River, including assessment of industrial and municipal discharges on water quality and biota, were the most important part of the

enhanced monitoring of Lake Ontario in accordance with the Great Lakes international surveillance plan.

As a result of these investigations, recommendations were forwarded to the New York State Department of Environmental Conservation regarding U.S. permits to limit discharges of trace organics in the Niagara River. The impacts of the United States and Canadian sources were elaborated and confirmed and provincial input was provided to the international Niagara River Toxics Committee studying the Niagara River.

Since the largest concentration of population on the Canadian side of the Lake Ontario basin is at the western end, special studies on the effects of Hamilton Harbor outflows on the nearshore area were continued and trace contaminants loadings from municipal and industrial discharges were assessed.

Studies on the Toronto waterfront continued. This included updating and continued assessment of the effects of Keating Channel dredging and lake filling at Eastern Headland which revealed no impact on the safety of drinking water. Surveys were carried out to identify the extent of sediment movement from the headland.

The sources of bacteriological contamination of beaches at St. Catharines were investigated and the program of providing information on the bacteriological levels at beaches along the Toronto waterfront was continued.

Similarly, monitoring of bacteriological water quality at Cardinal (Iroquois/Morrisburg) was carried out to assess the impact of sewage treatment plant effluents on local water use.

Waste Management Branch

Director: R. M. Gotts

The branch is responsible for the development and recommendation of policies, programs, guidelines, legislation and regulations required for comprehensive waste management programs for hauled liquid industrial and hazardous wastes and municipal solid waste.

In conjunction with these activities the branch also promotes the conservation, recovery and utilization of material and energy resources from wastes and provides an advisory service to the public and to those managing the waste.

Municipal Waste Management

Experimental Plant for Resource Recovery

The plant was in full operation throughout the year. In June 1982, receipts of municipal solid waste increased with the closing of the Dufferin incinerator operated by Metropolitan Toronto.

Marketing Development — Waste Derived Products

Market development activities for products of the experimental plant and resources recovered from wastes continued.

Based on promising results of the first stage of its investigation of the use of refuse derived fuel as a fuel in clay brick manufacture, the Brampton Brick Company, with Ministry funding, initiated preliminary work on the second stage leading to a plant-scale trial. The trial will be undertaken during 1983/84.

Compost from the plant continued to be provided for demonstration trials and for sale. Results from a demonstration study at Ridgetown College of Agricultural Technology confirmed the previous year's results that compost must be properly cured prior to use. Sales of compost during the year increased and demand continued to grow. Demand approached the plant's capacity and it is anticipated that it will exceed supply capability next year. Principal users include parks, conservation authorities, the horticultural industry, and garden centres.

Source Separation

Project Paper Recycling is in its fourth year of operation. Approximately 14,000 government employees in more than 50 buildings in the Toronto area are involved in the office fine paper recovery project.

Project Paper Recycling had a gross revenue of $24,000 for 1982, and removed 195 tonnes of saleable paper from the solid waste stream.

Based on Ministry experience and efforts to expand such activities beyond the provincial government, 11 municipal governments have initiated similar projects with Ministry-supplied hardware and technical advice. Hardware has also been supplied through recycling organizations and private companies to recover fine paper from 20 private sector offices.

Source Separation Grant Program

The incentive program for source separation, which started in August 1981, provides financial and other assistance for the development or expansion of municipal-scale multi-material source separation projects. Such assistance, totalling $330,000, was provided to six organizations or private companies operating municipal-scale source separation projects and to two companies operating fine paper recovery projects. This is an increase from the three companies receiving assistance during the first year of the program. Projects receiving Ministry assistance serve 11 municipalities and during 1982/83 resulted in the recovery of 8,000 tons of material.

Waste Management Studies

The Ministry offers a 50 per cent subsidy to groups of municipalities to encourage them to undertake long-term planning studies for waste management.

During 1982/83, 10 studies were active, seven were completed and two were initiated.

Waste Management Improvement Program

Under this program, which began in 1977, funds are provided to municipalities for upgrading and closing sites and remedial activities.

The budget for the 1982/1983 program was $700,000, comprising an initial $500,000 which was augmented by an Ontario employment-producing initiative of $200,000. The additional allocation generated 157 jobs for a period of two to eight weeks.

Other results included 21 site closings, the upgrading of 72 sites, completion of 24 site studies and site cleanup and other remedial activities at 29 locations.

Special Landfill Studies

Gas Migration Study:

The branch-funded three-year study of migration patterns of landfill-generated gas was completed. This will provide the basis of guidelines to control development of lands adjacent to and on waste disposal sites. The consultant engaged for the study investigated nine sites selected because of specific conditions affecting migration, such as soil type and climatic conditions.

Utilization and Control of Landfill Gas

Landfill-generated gas from the Kitchener landfill site was proposed for use in industrial boilers located at Best Pipe Ltd. in Kitchener. The design and implementation was conducted by Conestoga Rovers Ltd. of Waterloo. The project was funded by the Regional Municipality of Waterloo, the Ministry of Energy, and the Federal Government. Because it was proposed to use the gas extraction system as a control system for migrating gases to adjacent development, the Ministry also had the consultant conduct research on the effectiveness of the extraction system.

Carbonated Soft Drink Container Legislation

The Ministry undertook a major review of carbonated soft drink container legislation. A discussion paper outlining the nature of the problem and options for resolution was circulated for comment. Comments are being analyzed and a recommended course of action developed.

Sewage Sludge Utilization Program

Implementation of guidelines for the beneficial use of sludge on agricultural lands was completed. This program is carried out in co-operation with the Ministry of Agriculture and Food.

Blueprint for Waste Management – Municipal

The Ministry began a review of the Ontario waste management program. The objective was to produce a discussion paper, Blueprint for Waste Management, which would receive wide circulation and invite comment before putting into place a course of action. The branch directed much of its resources to drafting the document and its appendices which address virtually all aspects of waste management and lay the foundation for future initiatives.

Industrial Waste Management

Radioactivity

The Ministry takes an active role in monitoring and protecting the environment from concentrations of radioactive contaminants.

Staff continued to review data on the concentration of radionuclides in air and water and to provide a radiation consulting service for other branches and the regions.

Staff worked closely with the radiation protection laboratory of the Ministry of Labour on sources of natural radioactivity in Northern Ontario, and on sources of low-level radioactive wastes, such as old radium dial painting factories in Toronto.

PCB Handling and Disposal

A regulation (O.Reg 11/82) has been implemented to enable owners meeting certain preconditions to establish PCB waste sites on their own property pending the implementation of a provincially-approved PCB destruction facility.

The Ministry is monitoring the commercial development and potential application of several PCB destructive processes. These include the diesel engine (D&D, Smithville) for askarel, sodium reduction processes (Sunohio's PCBX) for low-level PCB contamination of mineral oil, and other techniques.

A number of mobile technologies have been developed which are capable of meeting the technical requirements for the destruction of PCB. Facilities based on these technologies offer an acceptable alternative to communities which may oppose the establishment of permanent, large-scale waste destruction facilities. Mobile facilities also offer the opportunity for communities to deal with hazardous wastes and to reduce waste transportation risks.

The use of mobile destruction facilities suggests the need for a revised regulatory strategy since most of Ontario's environmental legislation is fixed-facility oriented.

In February 1983 the Ministry published a draft guideline for the regulation and siting of mobile PCB destruction facilities in a discussion paper. This paper proposed terms and conditions, technical requirements for technology selection and approval and performance and

operational requirements based on fixed-facility criteria.

The intent of the proposals was the development of a regulation under the Environmental Protection Act which would preclude the necessity for repeated formal hearing procedures for each temporary destruction site, and yet offer an opportunity for public hearings on the proposals and public input to the criteria.

More than 700 copies of the guidelines-discussion paper were distributed to municipalities, public utilities, public interest groups, trade associations, professional associations and other government agencies. Responses to these proposals are under review.

Blueprint for Waste Management – Industrial

The Blueprint for Waste Management will, in addition to addressing municipal waste problems, also respond to problems with the management of hazardous and liquid industrial waste. Key aspects are addressed as follows:

Hazardous Waste Definition

An Interim Guideline for the Interpretation of the Hazardous Waste Definition was prepared and released for technical review. The document provides a comprehensive means to classify wastes into hazardous waste, site-specific waste and liquid industrial waste categories. It provides specific testing criteria and listings of hazardous and site-specific wastes. The guideline is being applied in the field to gain practical working experience. Following the review, the revised definition will be adopted by regulation under the Environmental Protection Act.

Proposed Generator Registration

A proposed generator registration regulation was developed which will require generators of hazardous waste, site-specific waste and liquid industrial wastes to register with the Ministry. Generators will be required to provide detailed information about the type and nature of the waste, quantities generated, current disposal practices, and in some cases, detailed analytical information. Each generator will be given a company identification number and wastes will be coded. The program will complete the Ministry's effort to have cradle-to-grave management of industrial waste when it is integrated with the expanded waybill system under revised Regulation 313.

Revised Regulation 313, Transfer of Liquid Industrial Wastes

Proposed amendments to Regulation 313 were developed which extend the coverage of the current waybill system. Transfers of hazardous waste and site-specific waste will be included in the waybill requirements, in addition to liquid industrial waste. A new waybill form will be designed to satisfy these additional requirements.

The data processing capability of the Ministry is also being upgraded to address control and monitoring requirements of the system, as well as providing statistical data on the management of these types of waste.

Hazardous Contaminants and Standards Branch

Director: C. J. Macfarlane

The branch provides services and programs relating to the management of hazardous environmental contaminants and of pesticides, including planning, research, co-ordination, development and implementation of policies.

A major function is the co-ordination of the Ministry's program for setting standards on chemicals for the protection of human health and the environment. Another important function is the control of pesticides, including their distribution, sale, storage and use. This is achieved by regulation, and by educating the pesticides industry, applicators, farmers, municipalities and the public on the proper use of pesticides.

Until August 1982, the Ministry's hazardous contaminants program and pesticides management were co-ordinated by the Hazardous Contaminants Office and the Pollution Control Branch respectively. In August, these programs were integrated into the Hazardous Contaminants and Standards Branch.

Industrial Chemicals Section

This section is responsible for assessing the significance of hazardous industrial contaminants, for establishing standards on chemicals, and for co-ordinating activities relating to their control.

During 1982/83, the functions of the former hazardous contaminants co-ordinators committee were assimilated by the hazardous contaminants management committee. This committee, chaired by the manager of the industrial chemicals section, is composed of assistant

directors from relevant Ministry branches. It is responsible for overseeing and recommending to the director of the branch appropriate actions, including resource allocations for the hazardous contaminants program. Three working groups, all of which report to the management committee, were formed: the hazardous contaminants information system group, the handbook group and the priority list working group.

The environmental health committee, with representation from the ministries of Health, Labour and the Environment, continued to be active.

A major accomplishment was the development of a list of 209 priority substances of potential concern to public health and the environment. A chemical assessment methodology was employed to facilitate the selection of chemicals. A survey is also being undertaken to obtain preliminary industrial information on the occurrence of substances in the environment. At year-end, work was continuing on setting priorities.

The industrial chemicals library continued to collect information on the 209 chemicals and groups of chemicals on the priority list. A computer search on dibenzo-p-dioxins and dibenzofurans was undertaken and compiled into two bibliographies. Acquisition lists were proposed periodically and circulated to other branches and the regions. The library answered requests for information on hazardous contaminants by performing computer searches, distributing journal articles, and lending materials.

Commercial and Agricultural Chemicals Section

The section carries out its programs under the Pesticides Act, and Ontario Regulation 715. It promotes good practices in pesticide use to achieve its goal of environmental protection. The section licenses operators, exterminators and vendors, issues permits for specific pesticides and uses, and provides training courses, seminars, study guidelines and material, including fact sheets, for applicants for licences.

The public is assisted by direct contact with specialists and through the dissemination of publications.

During 1982/83, the section held 2,116 examinations and issued 6,402 exterminator, 1,102 operator and 3,532 vendor licences. It issued 1,035 permits for the use of restricted products on land, 592 permits for the application of pesticides to water, and 207 permits for exterminations in structures.

The study of environmental fate, and monitoring for pesticides, particularly in ground and surface water, is a function of the section. Surface water monitoring data indicate only rare cases where criteria for pesticides have been exceeded.

Control of Termites

Under the termite control program, new infestations were discovered in Hamilton and Amherstburg.

The following is a list of municipalities with which agreements have been concluded and of grants approved for chemical treatments and structural alterations required for the control of termites:

Municipalities	Grants in $
City of Guelph	3,549
City of North York	10,158
City of Toronto	445,172
City of Mississauga	2,510
Borough of East York	62,928
Borough of Etobicoke	921
Borough of Scarborough	17,250
Borough of York	11,184
Township of Gosfield South	1,161
Township of Nicol	—
Township of Pelee	—
Township of Woolwich	10,757
Township of Mersea	—
Town of Dresden	—
Town of Fergus	—
Town of Kincardine	2,524
Town of Leamington	15,385
Town of Markham	696
Village of Elora	1,921
TOTAL	586,116

Environmental Assessment Branch

Director: P. H. Rennick

The Environmental Assessment Act and Ontario's implementation of the assessment process continue to be of interest world-wide. In 1982 representatives of the governments of Italy, Norway and Poland visited the Ministry to learn the details.

As of March 31, 1983, 93 environmental assessments for individual and class type projects had been received. Their status is as follows:

- 56 approved (with or without conditions)
- 8 exempted
- 8 referred for hearings
- 7 withdrawn
- 2 withdrawn and exempted
- 12 still in process

There were 58 projects at the pre-submission consultation stage.

There were two major private undertakings designated under the Act:

- The energy-from-waste project at Victoria Hospital, London
- The first undertaking proposed by a U.S. proponent — Fighting Island sludge disposal by the City of Detroit.

Work continued on the Class EAs for municipal roads, water and sewage and urban transit projects. The interim exemption covering these projects was extended to allow the Class EAs to be finalized, reviewed and approved.

Non-profit housing projects were exempted from the EA process.

During the year, staff participated in these major hearings:

- Ontario Hydro — Eastern Ontario — Plan Stage EA (electric transmission lines)
- Ontario Hydro — South Western Ontario — Plan Stage EA (electric transmission lines)
- Victoria Hospital — energy from waste
- Royal Commission on the Northern Environment

EA Update, an information digest for professionals interested in EA matters, was published three times.

Laboratory Services and Applied Research Branch

Director: G. C. Ronan

The Laboratory Services and Applied Research Branch provides the Ministry's analytical data base, research in the area of water and wastewater technology, as well as input to survey planning, data assessment, and technical expertise. Client groups that use this data include branches within Regional Operations, Strategic Projects, and the Environmental Planning Division.

Analytical Test Production

Table 1 shows this year's test load summary compared to last year's. In response to increased workload demands, the central laboratory increased its test outputs by 17 per cent over last year. For the first time, Ministry programs required more than 2 million analyses. The regional labs all showed modest production increases (5 to 7 per cent) while the central laboratory had an increase of 10 per cent over last year.

Table 2 shows branch clients and their laboratory workload requirements during 1982/83. Regional programs used two-thirds of the available test capacity: of these, Central Region (28 per cent) and Southwest Region (24 per cent) accounted for more than half the regional testload. Organic analyses in water and air continued to have a high profile.

The programs that the Environmental Planning Division, Strategic Projects, and Regional Operations carry out to monitor water, air and land are too numerous to document individually. The following is an outline of major programs for which analytical support was provided.

The Acidic Precipitation in Ontario Study program grew to more than 300,000 tests, mainly due to increased emphasis on terrestrial effects, sampling of through-fall, stem-flow and spring melt. Besides pH/acidity, the sampling program uses data on trace metals, major cations and anions to assess the impact of acid precipitation on atmospheric processes and aquatic and terrestrial ecosystems.

Organic analyses were characterized by a broadening in the range of parameters requested. The Niagara River program required a study of water, sediments, fish and biota for

TABLE 1: LABORATORY TESTLOAD SUMMARY (X 1000)

	Chemistry		Microbiology		Total	
	81/82	82/83	81/82	82/83	81/82	82/83
London	177	187	50	57	227	244
Thunder Bay	89	93	30	32	119	125
Kingston	106	105	53	64	159	169
Regional Labs	372	385	133	153	505	538
Inorganic Trace Contaminants	340	450			340	450
Water Quality	688	786			688	786
Pesticides	10	11			10	11
Organic Trace Contaminants	78	107			78	107
Microbiology			151	136	151	136
Central Lab	1116	1354	151	136	1267	1490
TOTAL REGIONAL AND CENTRAL LABS	1488	1739	284	289	1772	2028

organics and the laboratory's growing organic vapors capability was used to analyze ambient air levels of organics from numerous locations. A study of incinerator stack emissions was completed at the Commissioner Street, Ashbridges Bay and SWARU sites. Testing included a broad spectrum scan for dioxin and furan isomers.

The main dioxin testing program concentrated on monitoring raw and treated drinking waters from 17 locations. In addition, more than 200,000 anions, toxic metals, trace metals, and routine organic analyses were carried out on raw and treated drinking waters, nearly all of them at the most sensitive end of the analytical scale.

Figure 1 (page 28) shows the distribution of testing at the central laboratory, as a function of sample type. Programs aimed at monitoring water resources account for the major portion, followed by air monitoring, drinking water and sewage treatment programs. Industrial wastes and landfill surveys constituted a small but growing component of the workload.

The air monitoring network, consisting of 200 high-volume samplers as well as numerous other air monitors and samplers sited around the province, generated 130,000 metals, anions and suspended particulate tests. Phytotoxicology, which uses vegetation analyses as an indicator of atmospheric pollution, required more than 50,000 metals and anions tests.

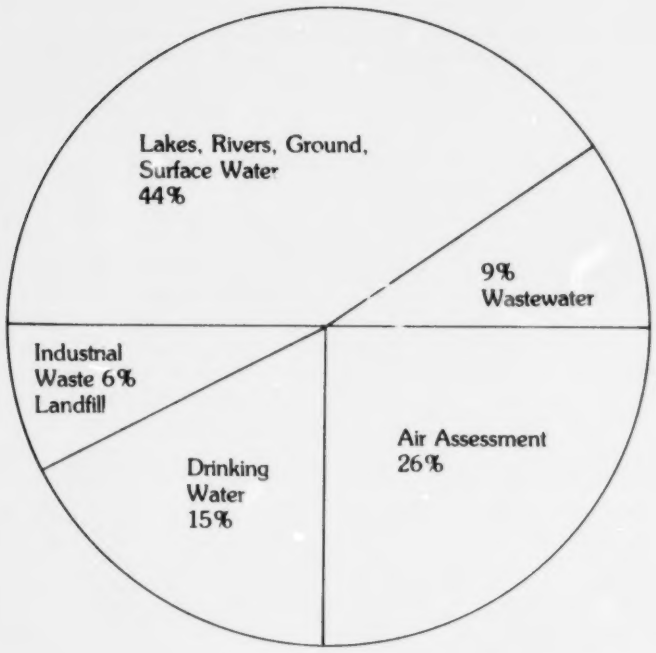
The fish contaminants program remained constant in total test requirements for mercury, trace metals, PCBs and other organochlorines. The growth of the Toronto area watershed management survey continued, as waters, sediments and biota were tested for metals, organics, anions, and bacteria in an ongoing effort to monitor Toronto's local tributaries and their input to the Lake Ontario basin. Wet weather surveys were conducted to monitor bacterial levels during storms and snow melt.

As part of the Ministry's concern over the possibility of toxic material issuing from landfill sites, the Elmira-Uniroyal, Tiny Township-Pauze, and Stouffville sites were sampled. These surveys stretched the branch's resources.

TABLE 2: WORKLOAD BY CLIENT

	ITC	WQ	OTC	PEST	MICRO	LAB	TOTAL
REGIONS							
Southwest	43500	4600	18594	488	87	229000	296269
West Central	33329	53699	16836	930	25023		129817
Central	109945	157347	14628	1428	68363		351711
South East	13996	8995	7260	410	1127	169000	200788
North East	37754	94655	4622	239	138		137408
North West	7992	1779	1214	52	106	125000	136143
SUBTOTAL	246516	321075	63154	3547	94844	523000	1252136
HEAD OFFICE							
Water Resources Branch	103524	289680	21772	6709	19595	15000	456280
Air Resources Branch	96438	104160	1567	846	2662		205673
Pollution Control Branch	2722	33689	1613	8	9122		47154
Other Ministries	200	10100		27	400		10727
Miscellaneous		27688	18271		8685		54644
SUBTOTAL	202884	465317	43223	7590	40464	15000	774478
TOTAL	449400	786392	106377	11137	135308	538000	2026614

FIGURE 1: WORKLOAD DISTRIBUTION BY SAMPLE TYPE



Applied Research

The three research sections (Applied Sciences, Wastewater Treatment, and Water Technology) continued to carry out investigative work on water and wastewater technology and on research aspects of waste disposal, water distribution and related topics.

Applied Sciences published four research reports and was involved in eight ongoing research investigations. The work is primarily in the field of pipeline materials and design and cold weather effects on distribution systems.

Wastewater Treatment was involved in 20 developmental research projects aimed at upgrading treatment technology. Projects included investigation of ultra-violet radiation as an alternative to chlorine for sewage disinfection, marshland treatment of municipal wastewater, and studies on the fate of hazardous contaminants during municipal wastewater treatment. Technical assistance was provided to municipalities and industries on matters of plant design, process operation and leachate collection.

The section participated in studies with the City of Stratford to cost-effectively reduce municipal pollution loading to the Avon River, and with Environment Canada in the first attempt to mass balance selected trace organics through a sewage treatment plant. The Section's other major activity is support of Ministry training program's, including activated sludge and chlorination workshops. The Section also operated the Ontario Experimental Facility, a 5.0 MGD plant for wastewater treatment development work and operator training.

Water Technology conducted research studies on trace organic contaminant removal, asbestos, iron and manganese control, and chlorination and ozonation of waters. The technical advisory service, co-ordinated through the regions, involved staff in treatability studies for selection of process/chemical application for 15 municipalities, and in solving water quality problems for more than 100 municipalities. Technical services were rendered which addressed:

- taste and odor control (actinomycetes, hydrogen sulfide)
- treatment plant upgrading
- corrosion control
- micro-macro-biological problems in distribution systems.

Annual Highlights

1982/83 was a year of advances in the laboratory's analytical capabilities. The computerized data system, LIS, entered its second year of operation, and improved turn-around times and data management. The average cost per test for metals analysis returned to pre-1980 levels, showing the rewards for method streamlining, multi-element analysis, and computerized data handling.

In the pesticides and organic trace contaminants sections the following developments highlighted 1982/83:

- Acquisition of a high-resolution mass spectrometer. This equipment will be used to analyze complex environmental samples and corroborate extremely low-level dioxin analysis. Gas chromatography/high-resolution mass spectrometry can anlayze down to 1 picogram (10^{-12} or one trillionth of a gram).
- The organic vapors sampling program resulted in the development of a unique thermal desorption capillary gas chromatograph, multi-component sampling cartridges, and an automated sequential sampler. These units will be tested for field applications.
- Resin cartridge sampling became a high priority development item, forced by the need to concentrate trace organics from large volumes of water (up to 200 litres). The concentrates are used for GC/MS testing and isolation of usable quantities of organic compounds for mutagenicity testing.
- Use of capillary GC with multiple selective detectors for simultaneous multi-component scan analysis.
- Development of validated sample extraction and analysis protocols for a broad range of dioxins and dibenzofurans in

drinking water, surface water, and incinerator-related samples.
- Introduction of an automated headspace analyzer based on capillary gas chromatography.

In the Water Quality Section, flow injection analysis was evaluated as a speedy automated anions technique with application to a wide variety of sample matrices. A direct-current plasma spectrometer was acquired, for the simultaneous determination of four metals in precipitation samples. The equipment freed up by this unit was applied to calcium magnesium, and hardness analysis in the water lab. New methods were also developed for tritium, iodine and radium in drinking water, as well as a specific ion electrode method for fluoride.

In the Inorganic Trace Contaminants Section, the demand for analysis of trace metals, toxic metals, and anions continued to increase. Nearly 40,000 samples were analyzed for each of zinc, lead, copper and nickel and another 30,000 for mercury, cadmium and aluminum. Last year 8,000 aluminum tests were required; the three-fold increase this year was due to concern over aluminum as the key component in acid rain's impact on fish.

Major analytical developments in 1982/83 included:

- Direct data transmission between the multi-element atomic emission spectrometers and the LIS.
- Development of inductively coupled plasma atomic emission techniques for the simultaneous determination of up to 20 metals in vegetation and sediment.
- Acquisition and implementation of ion chromatography for soil extract analysis.
- Micro-techniques developed for determining aluminum and electrolyte metals (sodium, potassium) in fish gills and fish sera.
- Add-on monochromators were successfully introduced to one of the atomic emission spectrometers, thereby extending the multi-elemental capacity to include sodium and potassium for routine metal scans.

In the Microbiology Section, most work was carried out as part of the Ministry's surveillance of municipal drinking water quality. Surveys were also conducted for the Great Lakes program, including inputs from the Niagara and St. Lawrence rivers, Port Dalhousie, and the Lake Ontario waterfront from Burlington to Scarborough. Specialized sulphur cycle bacterial studies were conducted in support of the APIOS program as well as surveys in Thunder Bay and Toronto.

The biohazards unit moved into its new laboratory. The facility cost $450,000 and provides safe handling for toxic, mutagenic and carcinogenic chemicals, which will be tested as part of the Ministry's growing hazardous contaminants program.

Mutagenicity tests are carried out on biological host systems ranging from bacteria to mammalian tissue cultures. The range of tests was expanded to include:

- Ames salmonella/mammalian microsomal test
- In vivo mouse micronucleus assay
- In vivo mouse abnormal sperm head assay

Major programs were: Whitchurch-Stouffville (in co-operation with University of Western Ontario and Ontario Research Foundation), Tiny Township/Pauze Landfill site, and development programs aimed at improving the effectiveness of the Ministry's biohazard testing capability.

Virological studies were carried out at Ashbridges Bay sewage treatment plant, Tillsonburg sewage treatment plant and at Boyd conservation area.

Many samples were analyzed in response to unique environmental problems, hospital requests, court actions or as supporting information for insurance claims or ministerial orders.

Highlights include:

- A Burlington resident complained that a large mass of "putty-like" material had been deposited on his property. The sample was shown to be a massive pollen ball agglomerated and held together by water.
- Residents complained of large clumps of white fibers which they feared might be asbestos, accumulating in their yards. Analysis proved them to be mineral wool from a "blown-in insulation" project being carried out near the neighborhood.
- Due to complaints in the vicinity of an abrasives plant in Niagara Falls, particulate matter was analyzed and the results compared to those obtained on household dust from the complainants' homes. There was nothing to connect the household dust to emissions from the factory.
- Blood samples taken from two Newmarket children showed high levels of lead, prompting authorities to remove the children from the home until it was cleaned and repainted.
- A drinking water sample from a well in Nigeria and one from the Dakhla Oasis in southern Egypt were analyzed for metals and anions.
- Samples of bottled water from local stores were analyzed for metals and anions, and data compared to that from Toronto tap water. No commercial product was found to be superior to the tap water, while some bottled waters did not meet Ontario drinking water objectives.
- The interim drinking water monitoring program was developed to address concerns over trace organics in raw and treated drinking water.
- The Niagara Falls water treatment plant organic trace contaminants removal study was developed as part of an overall effort to monitor the effectiveness of granular activated charcoal in water purification.

Quality Control

Quality control/quality assurance continued to be a key factor in all branch activities. An estimated 130,000 additional tests of all types were performed as part of an effort to validate and control analytical data reported to clients.

Numerous round-robins were initiated or participated in, including:

- cyanide in waters
- mercury in fish, water, and sediment
- metals in precipitation, waters, sediments and air particulates
- general chemistry parameters in natural waters from across Canada

• nutrients in sewage

These were in addition to the ongoing International Joint Commission, Canada Centre for Inland Waters and Federal Fisheries interlaboratory comparisons.

Numerous ad hoc comparisons were carried out with industries and municipalities, and within the branch, studies were undertaken to provide corroborative analyses of important health and legal samples. A good example of this is the application of the new high resolution mass spectrometer to confirmatory dioxin analysis.

Administrative Services

This Section co-ordinated the personnel, financial and budgetary functions for the branch, was responsible for the laboratory and research facility, and provided a health and safety program within the complex. Some $900,000 worth of chemicals and glassware were issued to the laboratories and research sections. Nearly one million bottles and tubes were washed, sterilized, processed, or shipped in support of Ministry sampling activities. The group also operated the computerized laboratory information system, which progressed from handling 60 per cent of the sample workload last year to 99 per cent this year.

An immunization program for the staff was carried out. Courses and seminars in first-aid, CPR and safety in the workplace were also provided.

Other Activities

Laboratory and Applied Research personnel chaired and participated in numerous technical/scientific committees. Staff presented 13 technical papers at scientific symposia, while six technical papers were published. Twenty-four in-house technical reports were published. The open house held by the branch in September 1982 attracted 3,500 persons. Besides this, visitors from Africa, China, Australia and Europe toured the facilities, and the newsletters Analysis and Dioxin News were circulated to hundreds of scientists and laymen.

regional operations division

Assistant Deputy Minister:
D. P. Caplice

This Division is the compliance and delivery arm of the Ministry. Its job is to enforce regulations, control emissions, and establish abatement programs.

The role of the six regions and one head office branch is to:

- *Regulate pollution sources*
- *Regulate construction and operation of wells*
- *Oversee the proper development, operation and closure of waste management sites*
- *Regulate storage and use of pesticides*
- *Manage and operate Ministry water and sewage plants and systems*
- *Monitor the quality of the natural environment*
- *Respond to public complaints and environmental emergencies*
- *Encourage the use of environmental safeguards in land-use plans*
- *Evaluate projects and to monitor environmental assessment recommendations*
- *Regulate water use*
- *Monitor and investigate discharges to the environment*
- *Control major noise sources*

In addition to the six regional offices, this Division also contains:

- *Environmental Approvals and Project Engineering Branch*

NORTHWESTERN REGION

Thunder Bay Regional Office,
435 James St. S.,
Thunder Bay P7C 5C6
Tel.: 807/475-1205

Kenora District Office,
808 Robertson St.,
Kenora P9N 1X9
Tel.: 807/468-5578

NORTHEASTERN REGION

Sudbury Regional Office,
199 Larch St.,
Sudbury P3E 59P
705/675-4501

Timmins District Office,
83 Algonquin Blvd. W.,
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Tel.: 705/264-9474

Sault Ste. Marie District Office,
445 Albert St. E.,
Sault Ste. Marie P6A 2J9
Tel.: 705/949-4640

North Bay District Office,
1500 Fisher St.,
Northgate Plaza,
North Bay P1B 2H3
Tel.: 705/476-1001

Parry Sound District Office,
74 Church St.,
Parry Sound P2A 1Z1
Tel.: 705/746-2139

CENTRAL REGION

Toronto Regional Office,
7 Overlea Blvd., 4th Floor
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Barrie District Office,
12 Fairview Rd.,
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Tel.: 705/726-1730

Muskoka-Haliburton District Office,
Gravenhurst P0C 1G0
Tel.: 705/687-3408

Peterborough District Office,
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Peterborough K9J 3G6
Tel.: 705/743-2972

Halton-Peel District Office
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Oakville L6H 2B9
Tel.: 416/844-5747

SOUTHWESTERN REGION

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985 Adelaide St. South,
London N6E 1V3
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250 Windsor Ave., 6th Floor,
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Tel.: 519/254-5129

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265 North Front St.,
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435 Grand Ave. W.,
Chatham N7L 3Z4
Tel. 519/352-5107

WEST CENTRAL REGION

Hamilton Regional Office,
119 King St. W.,
Hamilton L8N 3Z9
Tel.: 416/521-7640

Cambridge District Office,
400 Clyde Rd.,
Cambridge N1R 5W6
Tel.: 519/623-2080

Welland District Office,
637-641 Niagara St. N.,
Welland L3C 1L9
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SOUTHEASTERN REGION

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133 Dalton St.,
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Ottawa District Office,
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Tel.: 613/521-3450

Cornwall District Office,
4 Montreal Road,
Cornwall K6H 1B1
Tel.: 613/933-7402

Belleville District Office,
15 Victoria Ave.,
Belleville K8N 1Z5
Tel.: 613/962-9208

Pembroke District Office,
1000 MacKay St.,
Pembroke K8A 6X1
Tel.: 613/732-3643

Northwestern Region

Director: W. M. Vrooman

Industrial Abatement

The monitoring of discharges of wastes from the pulp and paper and mining industries makes up the major workload for this section.

The control order process is the major abatement tool used to require reductions in the discharge or emission of contaminants by industries to air, water or land. In 1982/83, three control orders were issued to companies. It is expected that the companies concerned will spend approximately $59 million in complying with them.

All major industries in the region are operating under the requirements of a control order or are in the process of having a new control order negotiated. The pulp and paper industry in Ontario is concentrated in the Northwest Region. In order to properly monitor discharges from this industry, the region continued the operation of a mobile toxicity testing laboratory located in Thunder Bay. The monitoring for toxicity continues to be a high priority as several of the control order requirements specify that discharges must become non-toxic.

The discovery of the Hemlo gold field 300 km east of Thunder Bay has greatly increased mining activity in this region. With the spin-off interest in gold exploration expanding to other areas, the workload of field staff has increased.

During 1982/83, regional staff investigated 63 spills and 125 complaints. The Ministry operates a 24-hour emergency number which received 51 off-hour calls, 26 of which required a response or investigation.

In January 1983, regional staff dealt with a spill of diesel fuel to a lake 160 km north of Red Lake. It occurred under Arctic conditions and could have caused considerable problems had it not been detected and properly cleaned up. The discharger cleaned up the fuel at a cost in excess of $200,000.

The discharge of grain dust from elevators in Thunder Bay continues to be monitored. In 1982, several problems in handling dust from the baghouses on the elevators were discovered. These problems were quickly resolved. The Ministry's air monitoring network in Thunder Bay shows that dustfall levels in the vicinity of the elevators continue to meet requirements.

In the 1982/83 fiscal year, 11 provincial offence tickets were issued, resulting in 10 convictions.

Municipal and Private Abatement

Nine major water and sewage projects were in various stages of construction, or completed in 1982/83. Included was a 0.42 MGD biological sewage treatment plant serving the Township of Marathon. The plant operates at half capacity and could accommodate additional growth expected with the Hemlo development.

Regional staff dealt with two communities under the private systems grants program in the provision or improvement of water supply systems.

The Red Lake waste site, which was filled to capacity, and eight Ministry of Natural Resources sites were closed. Red Lake joined with an adjacent municipality to develop one site. The MNR sites were closed, either due to being filled or because better sites were found. One privately operated site, serving the hamlet of Caramat, reverted to MNR operation. Fourteen municipalities improved their waste facilities.

Regional staff assisted head office staff in gathering data and planning field inspections of all waste disposal sites as part of the waste site inventory program. In addition, major leachate migration monitoring programs, initiated during 1981, were continued. Included were the municipalities of Marathon, Manitouwadge, Thunder Bay, Nipigon and Red Rock. Special leachate studies were concluded at the Balmertown/Red Lake and Dryden sites.

Six water well investigations were undertaken in response to requests by health units or individuals. In most cases, they were related to possible oil or chemical contamination.

Marinas and pleasure boats were inspected for pollution infractions. These inspections were conducted on a spot check or complaint basis, and no violations were noted.

A total of 117 cottages were inspected on four lakes (Maki, Pike, Cummins, Warnica) in the Thunder Bay District, under the cottage pollution control program. Twelve cottage-owners were required to take abatement action resulting from the 1980 inspection program.

A marked improvement was noted in water quality of the Atikokan River as a result of the completion of the Atikokan sewage treatment plant project. In Schreiber the new distribution system has improved the bacteriological water quality and reduced user flows.

Staff assisted the Improvement District of Balmertown in developing a five-year capital works program which will result in major upgrading of sewage and water facilities at the Cochenour and Balmertown townsites.

Utility Operations

In 1982/83, the region operated 12 water and 16 sewage projects serving approximately 18,000 and 39,000 people respectively.

The emphasis in utility operations centered around solving the problems of small communities. Red Lake continued its program of insulating looped water mains and undertaking a program to reduce losses. This problem was addressed in numerous communities.

A new water distribution and sewage collection system was installed in Madsen. This was necessary due to excessive freezing and advanced deterioration of the old system. The latest technology of insulated, heat traced piping and innovative engineering were used. This resulted in a cost-effective system for a small community with difficult terrain and severe climate.

The problem of severe corrosion, causing premature failure of water mains in Emo, was investigated. As a result, a program has been established for complete cathodic protection and/or replacement of the system.

Air Quality

The region currently operates 110 air quality monitors and precipitation samplers.

In 1982/83, the region:

- Continued an air quality monitoring and phytotoxicology program in support of industrial abatement activities in the pulp and paper, mining and grain elevator industries.
- Expanded the air quality monitoring network to Marathon, to provide full coverage of kraft pulp mills.
- Participated in the development of an Air Quality Index (AQI) and telemetry system.
- Continued the pre-operational monitoring program near Ontario Hydro's thermal generating station at Atikokan.
- Published an air quality report for 1981, as well as other technical reports on air quality surveys.
- Managed the development of the acid rain terrestrial effects study contracted to Lakehead University, and provided support to the precipitation sampling program conducted by Air Resources Branch in Northwestern Ontario and Northern Minnesota.

Water Resources

Water quality monitoring was maintained at 49 stations. Eleven supported the International Joint Commission tributary monitoring program.

Nine new permits to take water were issued and four permits were renewed.

Twenty water quality assessments were undertaken in relation to industrial effluents, sewage treatment plant effluents, drinking water quality, dredging of contaminated sediments, and lake eutrophication.

Fifteen groundwater quantity and quality assessments were completed. Additionally, 22 salt storage areas, operated by the Ministry of Transportation and Communications, were evaluated for their potential for groundwater contamination. A total of 380 water well records were verified.

By direct sampling and through management of an acid rain aquatic effects program at Lakehead University, the region evaluated the sensitivity to acidic precipitation of 100 lakes. Lakes near Atikokan were monitored to establish baseline conditions prior to emissions from the thermal generating plant of Ontario Hydro. A group of lakes in Pukaskwa National Park were discovered to be among the most acid-sensitive in Ontario.

Studies were made to investigate mercury pollution in the English/Wabigoon River system and to evaluate abatement measures at the Dryden paper mill.

Rainy River water quality was assessed and a report was prepared for the international Rainy River Water Pollution Control Board. The report indicated that water quality had improved as the result of improved effluent quality from the Boise Cascade Ltd. pulp and paper mill at Fort Frances.

Laboratory

During 1982/83, the chemistry unit performed 92,956 analyses on 12,986 samples while the microbiology unit performed 32,505 analyses on 13,260 samples. The total of 125,461 analyses amounted to an increase of 5.3 per cent over the previous year.

New analytical capabilities were developed for aqueous low-level total mercury and methylmercury, enumeration of *E. coli* and detection of toxigenic Aeromonas. An automated atomic absorption procedure for aqueous calcium and magnesium analyses was initiated. Standard plate count was introduced as an additional monitoring capability for municipal drinking water supplies.

An open house was held at the regional laboratory to commemorate the Ministry's 10th anniversary.

Environmental Planning

Twenty-six subdivision plans, 13 official plans or amendments and 15 environmental assessment reports were reviewed and a comprehensive regional environmental planning program was maintained.

Northeastern Region

Director: W. J. Gibson

Industrial Abatement

During 1982/83, charges were laid against Algoma Steel Corp., Algoma Ore Division, with respect to an October 20, 1981 fumigation in Wawa. The company was found guilty and fined $3,000. Incidents of SO_2 fumigations have been drastically reduced over the last year, primarily as a result of improved operating procedures by Algoma brought about by Ministry investigative activities. In addition, a new control order was issued to Algoma providing for extensive air and water pollution abatement programs which, when completed, will put the company in compliance with Ministry objectives.

An investigation of a fish kill on the Spanish River indicated poor flow regulation which resulted in dissolved oxygen depletion. A study group composed of Inco Limited, E. B. Eddy Forest Products Ltd., Ministry of Natural Resources and the Ministry of the Environment was established to identify flow management requirements. Certificates of approval were granted to E. B. Eddy at Espanola for pollution abatement equipment for air and water emissions. A secondary treatment system composed of surface area lagoons and spray pond will reduce BOD_5 levels to the Spanish River to 8,000 lb/day, as well as permit discharges to meet federal toxicity levels. This system is expected to come on-stream prior to December 31, 1983.

Reichold Limited installed a $1.5 million biological waste treatment facility at its North Bay resin manufacturing plant. The purpose of the facility is to pretreat plant waste waters to reduce organic loading on the North Bay water pollution control plant.

A prosecution was initiated against Grant Waferboard of Englehart for illegal operation of a woodwaste disposal site. The company pleaded guilty to 15 charges and was fined $5,000.

Two major mining companies, Inco and Falconbridge, were on extended shutdowns. A certificate of approval was granted to Falconbridge for the Moose Lake treatment system which will result over the next five years in substantial decreases in nickel discharges to the Onaping River.

Court cases against Falconbridge and Inco were active with charges against Falconbridge relating to the discharge of mine water to Fecunis Lake and against Inco for exceeding the ground level concentration of sulphur dioxide specified in the control order. In the Falconbridge case, the company was found guilty and fined; however, both the company and the Ministry are appealing. The Inco case will continue into the next fiscal year. Inco was also investigated for failure to report a nickel carbonyl emission to the atmosphere. No charges were laid as the investigation revealed the failure was not intentional or an oversight.

Kilborn Engineering was engaged by the ministries of the Environment and Natural Resources to establish close-out scenarios for the abandoned Kam-Kotia Mine area which continues to discharge acidic waters with a high metal content causing impairment to two rivers.

Negotiations with the Atomic Energy Control Board commenced regarding the final closing of the Agnew Lake mine property. AECB plans to extend the operating licence to require post-closing monitoring by the company for a specified period before the company will be permitted to withdraw completely. This is the first complete closing of a uranium operation in Ontario.

Municipal and Private Abatement

The private services funding project for Whitefish/Den-Lou was continued in 1982/83 and additional Ministry surveys were undertaken or continued for Kusk Lake, McCrae Heights, Wahnapitae East, and Romford Station in the Regional Municipality of Sudbury. Staff were involved in the implementation of a private services funding project to upgrade septic tank systems in Cache Bay. A consultant was hired to undertake a study of private water and sewer systems in Trout Creek.

Wells were developed in Gogama and a distribution system was constructed to provide 300 people with potable water. Drilled wells were constructed in Powassan and Trout Creek to replace a surface supply and a poor shallow well system, respectively. A project to upgrade waterworks facilities in Dubreuilville was granted an exemption order. White River was approved for funding of new water and sewage works under the Ministry's direct grant program.

The Ministry announced that Timmins will receive a $4.6 million grant for the expansion of the water filtration plant. A joint project to upgrade the water and sewage facilities in Sault Ste. Marie is under construction. It is anticipated that a major part of the infrastructure phase will be complete by the end of this year. The projects, when complete, will provide the municipality with a new surface water supply at Gros Cap and the second sewage treatment plant to be located in the west end of the city.

District staff assisted in the construction and monitoring of the Cobalt Marsh experimental facility utilizing cattails as a means of sewage treatment. This project will continue next year and is being jointly funded with the Ministry of Northern Affairs.

Funding under the Ministry's waste management improvement program has been extended to Thessalon and the Townships of Laird and Thompson for upgrading their individual waste disposal sites. Smooth Rock Falls submitted an environmental assessment to the Minister for the establishment of a new waste disposal site. The environmental assessment was approved.

A waste management study for Little Current was completed regarding the establishment of a new landfill site to service the town. Waste management funds for site improvements were provided to serve municipalities in the Sudbury and Manitoulin districts. Staff also were involved in the first stage for a new landfill site for Onaping Falls in the Regional Municipality of Sudbury.

Sault Ste. Marie and Cherokee Disposals Ltd. are proposing to submit a joint application for a new landfill site. Investigations into the longevity of the existing Cherokee site have revealed it to have an available capacity for 3.2 years. Staff worked with the Ministry of Natural Resources as three unsatisfactory waste disposal sites were closed in the Lake Temagami area. The number of disposal sites on the lake shore has now been reduced to two, from ten in 1978. When this program is completed, cottagers and residents will be served by a landfill site with a waste transfer station.

Abatement staff investigated 259 spills and 1,127 complaints.

Air Quality

The region operates an air quality monitoring network consisting of approximately 160 monitors. In the Sudbury area, the network collects air quality data on a real-time basis from about 25 sensors. These data are telemetered via telephone

lines to a data acquisition centre at the Sudbury office. This telemetry network enables real-time surveillance of the Inco Ltd. supplementary control system which the company operates under a control order, to limit SO_2 ground level concentrations. In 1982, the network was expanded to collect meteorlogical data from Hanmer and Elliot Lake.

The region outfitted a four-wheel-drive van to serve as a mobile air monitoring unit. This will enable staff to conduct air quality surveys at any location accessible by road and to assist abatement staff in monitoring the release of hazardous substances to the atmosphere in contingencies.

Staff also maintained vegetation and soil surveillance studies in order to determine the degree and extent of air pollution injury to vegetation, and also to determine trends for contaminant levels in soils and vegetation. Pre-operational soils and vegetation sampling surveys were conducted in the vicinity of Eldorado Nuclear Ltd. and Blind River and at the site of the proposed phosphate mine in Cargill Township near Kapuskasing.

Staff responded to 38 complaints regarding suspected air pollution injury to vegetation.

Water Resources

The region maintained 173 water quality monitoring stations to assess the success of water treatment facilities at industrial and municipal sites. Nineteen stations are operated intensively over the warm-water, low-flow summer period to verify the predicted capacity of rivers to assimilate wastes.

Studies on the impacts of mining-milling operations on receiving water bodies were completed. Biological impact assessments on the pulp and paper rivers were continued and extensive recreational lake water quality inventories were expanded.

Inspections were carried out on 800 newly constructed wells, the impact of mine tailings disposal on groundwater resources was evaluated and monitoring of groundwater quality in relation to specific complaints was undertaken.

Approvals and Planning

The unit reviewed 70 quasi approvals under various legislation. Twenty-three environmental assessment and study reports, 36 land use planning documents, and 50 certificates of approval for landfill and organic soil conditioning sites were issued. Forty-seven applications for water taking permits were reviewed and permits issued.

Pesticides

Staff investigated 12 pesticide-related complaints and inspected the premises of 240 licensed retail and wholesale pesticide vendors.

An aerial surveillance program was undertaken to monitor the use of pesticides by the pulp and paper industry. It indicated that the application generally followed the guidelines and regulations under the Pesticides Act.

Ten water extermination permits were issued for the control of nuisance aquatic weeds and black flies. Ten special use permits were issued for the control of bats and bees.

Utility Operations

The utility operations section continued the operation of 22 water treatment plants and 43 water pollution control facilities serving a population of approximately 245,000. The region also started expansions of water pollution control facilities at North Bay, Parry Sound and Powassan. Upgrading of the water distribution system at White River began.

The sludge utilization program in Northeastern Region continued during 1982/83 with the operation of sites and systems for 12 water pollution control plants.

Southwestern Region

Director: D. A. McTavish

Industrial Abatement

Fighting Island — Detroit River: Fighting Island has been used by a soda ash manufacturer in Michigan for the disposal of solids which were deposited in waste settling beds created on the island. Analysis of herring gull eggs has given rise to a concern that organic contaminants in the eggs may have originated from material in the waste beds.

Extensive analytical work on samples of the settled solids, the waste stream flowing to the island, liquid discharge from the island and sediments in the river around the island has failed to demonstrate that organic compounds are contained in the wastes in significant quantities.

The process which generated the wastes directed to the island is no longer in operation.

Polysar — Biological Oxidation Treatment Plant, Sarnia: In the manufacture of synthetic rubber products, several wastewater streams are generated which contain substantial quantities of organic materials, many of which are detrimental to the St. Clair River. The company was placed under a requirement and direction order in 1976 which established a five-year abatement program. Interim organic loading reductions were achieved by 1978 and in 1982 a large-scale biological oxidation wastewater treatment plant began operation. Early indications, based on effluent monitoring results, are that the design objective for contaminant removal efficiency will be fully met. Capital cost of the works was $23 million.

Stream Pollution from Livestock Operations — Prosecutions: In the three years prior to 1982, the region carried out extensive programs aimed at acquainting farmers with the toxicity of livestock manure to acquatic life and the unsatisfactory handling and storage practices which lead to gross pollution of streams, often resulting in major fish kills.

Although the incidence of these occurrences appears diminished, the problem is still one of concern.

Complaints from downstream farmers whose use of surface water for livestock watering is interfered with indicate an additional concern.

Following investigations of several incidents, the region undertook 12 prosecutions of livestock farmers. Eight involved hogs, one poultry, and three beef cattle. Negligence was considered a factor in all of these incidents. Eleven convictions were secured with fines in the range of $500 to $3,000.

Municipal and Private Abatement

Activities for this section included:

County of Oxford: Staff worked closely with the County of Oxford in the examination of a landfill site proposal which would carry the county through the next 15 years. The county worked on the site proposed for approximately eight years, spent in excess of $1 million, and had Ministry approval for the technical aspects. The consolidated hearing board was unconvinced that the site should proceed as designed in the location chosen and turned the proposal down. This has led to an appeal by the county.

The county has now almost run out of landfill space and region staff have been working with county staff in order to secure emergency sites until a permanent facility can be established.

Fighting Island: The proposal to rehabilitate Fighting Island utilizing waste treatment plant sludge from Detroit has proceeded much more quickly than in the past.

The proposal will be subjected to the environmental assessment process and approval or rejection will not take place until public review has been completed. It is anticipated that the hearing could take place during 1983/84.

City of London: Staff became heavily involved with both the public and the proponent in the proposed Victoria Hospital energy-from-waste project. The project was finally subjected to an environmental assessment and the public review of the documentation was completed shortly before the end of 1982. An extensive hearing was started in early 1983 and completed in early June.

Waste Management Studies: In keeping with the Ministry's urging that waste management systems be consolidated, three counties have taken advantage of funding available in order to undertake waste management studies. The County of Essex has undertaken a 16-month study which has looked at various alternatives for a 20-year period. The committee is deliberating the alternatives and choosing the direction it should take. It is anticipated that an alternative will be available before the present landfill sites are full.

The County of Kent, in conjunction with the City of Chatham, has undertaken an examination of the potential for converting refuse to energy through burning.

The County of Bruce has also undertaken a waste management study. The study is now complete and is being deliberated by County Council and various municipalities.

Air Quality

Sixty-four continuous air quality monitoring instruments were operated in 1982/83, along with 78 suspended particulate samplers. At year's end, 39 monthly sampling monitors (dustfall and fluoridation) were in operation.

Air quality reports were completed for Sarnia, Windsor and the Michigan-Ontario transboundary area.

Special studies and developments included:

- Assessment of the impact of quarry operations in the Beachville area, including improved monitoring of different particle sizes and identification of particulate components.
- Monitoring of lead in the vicinity of a new battery plant in St. Thomas.
- Continuation of monitoring for radioactivity in suspended particulates in the vicinity of the Bruce nuclear power development site.
- Monitoring for chloride in suspended particulates near a salt manufacturer in Windsor.
- Review of potential air quality effects associated with an energy-from-waste plant for Victoria Hospital, London.
- Participation in developing organic vapor sampling methods, an ozone control strategy for Ontario, formulation of a new Air Quality Index and an improved provincial telemetry system for transmitting air quality data.
- Development of improved suspended particulate sampling and equipment to provide samples to reflect the influence of varying meteorological conditions (wind direction and speed).

Water Quality

Surface water assessment continued to increasingly focus on agricultural impacts on water quality. Intensive agricultural use of the Rondeau Bay watershed has resulted in excessive turbidity and a poor fishery. Water quality studies on the bay continued, and staff worked with other ministries and a local farm group to develop an erosion control plan.

Studies on agricultural impact were also carried out on two subwatersheds of the Maitland watershed. Staff worked with the Maitland Conservation Authority, through a consultant, in evaluating the relative importance of impacts such as cattle access, soil erosion, drain clean-out activities and the lack of stream buffer strips as a basis for corrective actions.

Regional water resources staff assessed the impacts of several fish hatcheries. All new hatcheries now require Ministry review, and a certificate of approval. Basic hatchery effluent treatment such as a settling pond is normally required.

Eight sewage treatment facilities were evaluated to ensure compliance with Ministry water management objectives or to provide guidance for expansion or upgrading of treatment works. Work also continued on innovative, pilot-scale treatments including the Listowel artificial marsh, and the snow-making facility at the Blue Mountain ski resort where partially treated sewage was converted to snow.

Regional involvement continued in the Stratford-Avon River program, which revealed that additional environmental controls are required both in the City of Stratford and

throughout the agricultural portion of the watershed.

Monitoring of water quantity and/or quality was carried out at 135 stations within the regional network.

Further mapping of the sensitivity of groundwaters to pollution was carried out by staff under supervision of Water Resources Branch personnel. Approximately 50 per cent of the region has now been mapped.

An investigation was completed into the impact of agricultural fertilizers on a municipal well in the village of Hensall. This supply has become polluted by nitrate from farming activities and plans have been developed to initiate remedial measures with help from the farming community and the Ministry of Agriculture and Food.

Further study was made of the effect of intensive farming practices on private, shallow wells in Essex County.

With the assistance of the Ministry of Labour's laboratory, monitoring and more detailed study of natural radioactivity levels in municipal wells were carried out.

Waste disposal operations took up a large percentage of groundwater staff time. Investigations of problem sites, groundwater monitoring, review of hydrogeological and design reports and attendance at hearings were neceasary for numerous sites. This work has resulted in remedial measures and improvements at many waste disposal operations.

Several large spills of gasoline and industrial chemicals required assistance in the evaluation and cleanup of contaminated groundwater.

Water well inspection staff checked 1,200 new wells for proper construction and/or pump installation. Other private and municipal wells were inspected for construction problems and assistance was provided in the plugging of abandoned wells.

As a result of concerns for potential contamination of groundwater, a study was commissioned into the environmental implications of deep well disposal of brines to the Detroit River group of formations. This will provide a basis for this Ministry and the Ministry of Natural Resources to assess requirements for the operation of existing and proposed deep disposal wells.

Utility Operations

The section operates 104 treatment facilities including 49 lagoons, 28 water supplies (18 are surface water sources) and 27 mechanical sewage treatment systems. In addition to the collector and distribution systems associated with the majority of these 104 projects, 12 other collector and distribution systems which include portions of municipaily-owned treatment facilities are operated by this section.

Because of municipal government requirements, another 52 collector and distribution systems are operated as individual projects. The operation of these facilities results in servicing a population of approximately 750,000, many of whom are served by both water and sewage systems.

Five new projects were completed: One mechanical sewage treatment plant, two lagoon systems and two water treatment plants. In addition, four expansions were completed: One sewage treatment plant, two lagoon facilities and one pump station and collector system. The total cost is approximately $14 million.

Two new treatment facilities (one lagoon and one mechanical plant) are under construction and another three (one water plant and two mechanical sewage treatment plants) are in design stages. In addition, six existing treatment plants (five lagoons and one water plant) are under expansion. Another 18 existing systems are in design stages for expansion (eight lagoons, seven water treatment plants and three sewage treatment plants).

Negotiations are nearing completion for the takeover of two Ministry of Government Services plants (one water and one sewage).

Environmental Planning

The unit reviewed and responded to 101 land use planning submissions and vetted approximately 800 restricted area bylaws. Twenty-nine new water taking permits were issued and 141 were renewed. Comments were provided to the Ministry of Natural Resources on 30 applications for licences under the Pits and Quarries Control Act and six for approval under the Lakes and Rivers Improvement Act. A total of 17 environmental assessments were reviewed. In response to public and municipal enquiries, 26 intrepretations were provided on the applicability of the environmental assessment legislation to municipal undertakings. One pipeline proposal was reviewed and the unit co-ordinated and provided input to 19 engineering reports dealing with sewer and water projects. Comments were provided to head office on 11 policy papers and guidelines.

The unit presented a discussion paper at the Ministry's land-use planning seminar on municipal bylaws prohibiting waste disposal sites. Expert testimony was provided before the consolidated hearings board on the Salford landfill site. Staff participated in three Ontario Municipal Board hearings in support of Ministry objections to municipal land-use plans. The unit assisted the land-use co-ordination section in its review of the hearing officer's report of the Niagara Escarpment Plan and provided input to the branch's formulation of land-use compatability policies for pits and quarries.

Laboratory Operations

In support of regional environmental evaluations and pollution control programs, the regional laboratory performed 187, 013 chemistry tests on 24, 306 samples and 57,301 microbiological tests on 19,933 samples.

West Central Region

Director: G. H. Mills

Industrial Abatement

The following highlight initiatives by this section:

Atlas Steel control order was amended to require compliance by September 1983. A solidification plant to treat waste acids, alkalis, and rinse waters has been essentially completed at a cost in excess of $6 million. Start-up is anticipated in July 1983.

Cyanamid Canada's Welland plant remained in compliance with its control order and construction is now complete on containment and product storage ponds required to contain effluent and concentrate it into a saleable product. Start-up is planned for 1983, well ahead of the date in the control order of September 1984. Cyanamid also completed installation of an ammonia nitrate drying train, eliminating old equipment which was a source of emission.

Ontario Paper Company ceased operation of five old paper machines and the ground wood mill with the result that all waste water is now treated. The control order was extended to December 1983 to allow sufficient time for equipment commissioning.

Norton Abrasive Company extended its main stack to 250 feet and it is expected that emissions of hydrogen sulphide and sulphur dioxide will now comply with Ministry standards.

The Old Walker Brothers quarry landfill in Thorold ceased operation and the new landfill was opened.

Rothsay Concentrates Company completed installation of a new waste water treatment facility. Effluent is stored and irrigated on company property. Significant operating problems were encountered and satisfactory effluent treatment is now expected in 1983.

Breslube Industries waste oil-refining plant in Breslau remains the most significant source of odor complaints. Although a number of modifications to control equipment were made, a study by the Ontario Research Foundation confirmed several sources of intense odor. As a result, a new program has been developed with satisfactory emmissions to be achieved in 1984. A control order has been drafted.

Guelph Do-Lime compieted a program to eliminate or control fugitive sources of lime dust. Stack sampling of the lime kilns was contracted to the Ontario Research Foundation.

In Hamilton, Stelco and Dofasco continue to be in compliance with control orders. Both companies completed a variety of environmental projects at a cost in excess of $10 million.

Ontario Hydro in Nanticoke installed new NOx burners on Unit No. 5 at a cost of $1.5 million and indicated an intention to proceed on the other units.

The region overall handled 1,896 complaints largely related to odor, smoke, dust, water and noise. It investigated spills at 56 point sources and 13 on highways.

The Special Investigation Unit was involved in 84 investigations, which resulted in four prosecutions.

Achievements included:

- An investigation into 19 missing PCB-contaminated transformers was concluded successfully after 10 months of work. No charges could be laid due to the six-month statute of limitations in effect at the time the incident occurred. However, following the investigation, Industrial Abatement ensured proper clean-up and storage was carried out.
- An investigation into chemicals dumped beside the Welland Canal concluded successfully when the suspect was found after several months of investigation. A charge has been laid and the case is before the courts.
- A major investigation, conducted jointly with Industrial Abatement, is being undertaken at a major industry in the Region of Niagara. The case involves buried wastes.
- The unit was instrumental in preparing and implementing a province-wide program on Regulation 299 which controls containers for carbonated soft drinks.

Municipal and Private Abatement

Regular inspection and monitoring of water plants, sewage plants and waste disposal sites — both municipally and privately owned or operated — is an important element in the section's activities.

A total of 441 inspections were carried out at 275 water treatment and sewage plants, and 1,003 inspections at 349 waste disposal sites (including landfill and sewage sludge sites).

Sewage Works

The Town of Palmerston is proceeding with a multi-year program of sewer replacement prior to construction of a new sewage facility.

The Town of Mount Forest is requesting Ministry funding for repair and replacement to its sanitary sewer and storm sewer system. This work may be cost-effective in delaying a sewage plant expansion.

A plant expansion to triple the capacity of the Paris sewage treatment plant has been completed.

As part of a major expansion to the Town of Orangeville sewage treatment plant, an interim expansion was carried out to provide air augmentation and improvements to the sand filter systems. This has resulted in the plant producing one of the better effluents in the province. Discharge is to the headwaters of the Credit River, a sensitive cold-water fishery.

A certificate of approval was granted for the conversion of the Waterford lagoons to seasonal discharge to improve water quality in Nanticoke Creek.

Ash slurry from sludge incineration at the Hamilton STP is now being directed to large concrete tanks where the supernatant is sent back to the STP rather than to Redhill Creek. This ash will be used for road construction.

Surveillance of septage haulers discharging into the Hamilton STP has resulted in revamping of the region's record-keeping and closer monitoring.

The Phase III program on upgrading the Welland sewage treatment plant was completed and was

in full operation in early 1983.

The Stevensville/Douglastown lagoon and outfall with 75 per cent funding from this Ministry was completed and ready to be utilized. However, because of the flood plain mapping controversy local residents refused to hook up in protest.

A provincial sewerage project was undertaken at the Town of Fort Erie. Low cost alternative projects were approved for Queenston and Port Robinson.

Filter backwash water from the Fort Erie water treatment plant is now being treated by a sedimentation process prior to discharge into Lake Erie. Also, backwash water from the DeCew water treatment plant is being redirected to Moodie Lake instead of being discharged to Beaverdams Creek. Sedimentation sludge is being hauled to the sewage treatment plant.

Waterworks

Upgrading of water quality is under review in the villages of Arthur, Erin and Elora. A request for grant assistance has been received from Arthur and is expected from Erin and Elora.

Low-cost alternatives to provide some form of municipal supply have been stalled in the communities of New Dundee and Linwood due to a split in public opinion on the need.

Low-cost alternatives on Lynden and Sheffield water supplies are nearing completion. The design of the Lynden system is now under way by the Region of Hamilton-Wentworth and installation is planned for 1984. The Sheffield alternative is still under discussion by the Township of Flamborough.

At Niagara-on-the Lake, the controversial water supply from the Niagara River was replaced in 1982 by the DeCew Falls supply.

Routine water quality monitoring of the Niagara River revealed trace amounts of dioxin in two raw water supplies, Niagara Falls and St. Catharines. Subsequent to this finding, a dioxin action plan including extensive monitoring is being implemented.

As a result of continuing public concern about Niagara River water quality, a preliminary study on the removal of trace organic materials from Niagara Falls water was completed by the water technology section. More intensive study involving pilot-scale work on granular activated carbon absorption was undertaken by a consultant retained by the federal and provincial governments.

Waste Management

An ongoing study in Waterloo Region is examining the feasibility of an energy-from-waste project in Kitchener to burn garbage to provide steam to B.F. Goodrich. The project would prolong the life of Waterloo Region's major landfill site in the City of Waterloo.

The first Ontario commercial installation of a methane gas recovery system was completed by the City of Kitchener. Bestpipe Co. is now receiving methane gas from a closed landfill site to provide fuel in its boilers for production of concrete pipes. Initial volumes of gas have been lower than expected, but this may increase in time.

Haldimand-Norfolk Region has retained consultants to evaluate its waste management systems and sites to prepare for environmental assessment hearings in proposed site changes and expansion program.

The Delhi landfill site is scheduled to close in 1985, followed by the North Walsingham site, then the South Walsingham site.

Intensive monitoring of leachate movement from the Beverly landfill site continues to ensure that no harm is being caused to nearby wells.

Studies on dioxin/furan emissions and combustion characteristics of the SWARU incinerator in Hamilton have been completed and the final report is expected in 1983.

The Regional Municipality of Niagara is conducting a regional waste management master plan study with the support of the Ministry. The study, undertaken by a consortium of three consulting firms, is expected to be completed next year.

As the result of several hydrogeological investigations by local municipalities, four landfill sites in Niagara Region affecting seven local municipalities, require major corrective measures and/or expansions.

Three-hundred-and-fifteen pleasure boats and 39 marinas were inspected under the boating and marina program. Eight boats were found in violation.

Pesticides

- 109 permit applications were reviewed along with site inspections for restricted pesticide use.
- 170 pesticide-related complaints were investigated. Herbicide damage and drift of pesticides accounted for 35 per cent of these complaints.
- 59 man-days were spent on training and examination of applicants for exterminator licensing; 12 man-days were spent on the inspection of wholesale and retail pesticide vendors; 600 general inquiries relating to pesticides and the control of pests were handled.

Air Quality

The region's air quality monitoring network operated about 200 devices. The following special surveys were undertaken:

- General Abrasive Ltd., Niagara Falls — two one-week surveys with the new special surveys vehicle during shutdown and post-shutdown periods of the silcon carbide furnaces.
- Exolon Ltd., Thorold — one-week survey with the special surveys vehicle.
- Stelco, Nanticoke — hydrocarbon survey near coke ovens.
- Chemical Waste Management Ltd., Smithville — one-week PCB survey.
- Allanburg meteorological station — operation of portable aerovane to investigate suspect lower level telemetered wind speed data.
- Thorold Paper Mill — chlorine sampling.
- Upper Ottawa Landfill Site, Hamilton — hi-voi survey for the benefit of Upper Ottawa health study team.
- Columbia Carbon, Hamilton — size fractionating hi-vol survey.

There were 34 complaint investigations by the phytotoxicology section alleging vegetation damage due to industrial or other pollution emissions; 24 identified symptoms as being due to natural causes.

The Air Pollution Index in Hamilton reached or exceeded the advisory level of 32 twelve times, for a total of 206 hours. The maximum was 39. The APIs in Niagara Falls and St. Catharines did not reach the advisory level.

Water Resources

A supportive position was successfully defended for the proposed sewage locations for Drayton at a public hearing held under the OWR Act.

Studies at Nanticoke on Lake Erie were continued as were studies on the effects of stormwater and combined sewer overflows on Hamilton Harbor and Windermere Basin. A report on the water and sediments in Windermere Basin was released.

Water resources field work was completed for the environmental assessment of the Palmerston sewage works expansion.

A study of Aberfoyle Creek was continued as part of an existing and future water management problem due to excessive pumping of wells and wastewater discharge by Aberfoyle Fisheries and the dewatering of a gravel pit by Capital Paving. A report on the operation of five trout farms was released in co-operation with Southwestern Region.

Ninety water quality monitoring stations, eight automatic streamflow recording stations, 25 manual stations and 24 observation wells were maintained.

A total of 395 water taking permits were renewed. Of 49 new permits issued, 27 were for groundwater and 22 for surface water.

Forty-two groundwater quality and quantity problems were evaluated and about 750 water well records were verified.

The major ground/surface water study at Uniroyal Chemical in Elmira was continued to identify the extent of contamination and to determine the best method to control the spread of contaminants from areas where waste has been deposited and from present operations. Two nearby closed municipal landfill sites were also studied to try to determine their impact on water resources of the area.

Support was provided to the Niagara River Improvement Team on water resources monitoring and water chemistry data compilation.

A new major groundwater interference problem was related to dewatering by Steetley Industries in the Township of West Flamborough. Steetley opened up and dewatered a new section of the quarry north of its existing operation, causing at least 20 wells to fail. Additional interference was anticipated.

About 650 requests for groundwater data, 140 for surface water data and 225 for fish contaminent data were answered. Fifteen fish kills were investigated and 12 marine construction evaluations were done.

Evaluations and follow-up studies were done on 25 landfill and waste sites, both municipal and industrial.

Environmental Planning

Staff reviewed five proposed official plans, four secondary planning documents, 61 proposed official plan amendments and four environmental assessment related documents and proposals.

Utility Operations

The region was responsible for the operation of 35 sewage treatment facilities and five water supply systems. The sewage treatment facilities consist of a variety of types ranging from lagoons to activated sludge plants with tertiary treatment.

Central Region

Director: G. Mierzynski

Industrial Abatement

Capital expenditure by industries for major abatement programs totalled $15,960,000.

Staff responded to 4,310 complaints and 206 spills. Odor complaints from various sources represented the majority of problems.

The director issued four control orders and two formal approvals, which required companies to install specific equipment to improve the operation of their emissions. Several informal program approvals to achieve pollution abatement were negotiated.

The following represents the major pollution abatement activities in the region:

In the Junction Triangle of Toronto:

- Six industries were subjected to intensive abatement programs to address odor problems.
- A control order was issued to the Glidden Company and program approvals to Inmont and Nacan; the other three companies in the area carried out works to the Ministry's satisfaction through informal program approvals negotiations.
- Staff participated in the Mayor's Task Force which resulted in an alert plan being issued in four languages to neighborhood residents. It detailed how citizens should go about getting action on complaints and established a co-ordinated approach for action by the Ministry and municipal departments.
- Staff participated in the setting up of a health study by the Health Department, City of Toronto, for residents of the Junction Triangle area with 50 per cent provincial funding. An environmental liaison committee, with citizens, companies and government representatives, was agreed upon to establish communications and resolve the environmental problems.

The shutdown of the Shell refinery in Mississauga resulted in the development of Ministry draft guidelines for the shutdown of industrial operations and the rehabilitation of industrial sites. The objective guideline is to ensure minimum impact from industries on the environment and to ensure that only appropriate future uses will be made of such property.

Gulf Canada Ltd. has installed a major biological wastewater treatment plant at its Clarkson refinery at a cost of $4 million. The plant will significantly reduce loadings of oils and phenols in effluent discharges to Lake Ontario.

Dorcan Ltd. has replaced a cupola furnace at its Orillia foundry with an electric or melting furnace incorporating new air emission control equipment. The cost was $2.5 million.

Port Hope Council has formed an environmental advisory committee of citizens and councillors. The committee receives monitoring data from the Ministry and advises council on these matters. Ministry staff participate in the meetings.

Union Carbide Co. in Lindsay has developed a staged program to recycle waste, dispose of stored liquid wastes and de-water sludges by the installation of an evaporation crystallization unit which permits the recycling of ammonium compounds and the recovery of sodium sulphate. Several million gallons of strong chemical wastes that have been stored in lined ponds on company property will be recycled for plant use or pre-treated and discharged to the Lindsay sewage treatment plant. Sludges from the pre-treatment clarifier which were formerly disposed of at a local landfill site will now be de-watered in a two-stage system on company property and the solid wastes transported to a landfill site.

In the Toronto area, Canada Malting Co. Ltd. upgraded its dust collection facilities.

Gordon Young Ltd. improved its odor abatement program for rendering operations. Further work is being continued.

Bates Chemical Co. Ltd. completed spill containment facilities at its tank farm.

Toronto Riverdale Hospital converted its boilers to natural gas. North York General and East York General Hospitals discontinued garbage incineration by the installation of compactors.

Banner Packing Ltd. installed a new odor control system.

J. T. Hepburn Co. Ltd. installed sand reclamation and improved storage.

An extensive surveillance program of existing and abandoned gravel pits in the Regional Municipalities of York and Durham was undertaken. It is aimed at ensuring sound rehabilitation programs and the prevention of unapproved waste disposal. These practices can have adverse impact on groundwater resources of the area. Clean-up of many sites was initiated and there are pending prosecutions.

Municipal and Private Abatement

In the Muskoka-Haliburton-Simcoe recreational area, 979 private sewage systems were inspected on Boshkung, Long, Little Dudmon, Negaunee, Lake of Bays, Muskoka and St. George lakes for the purpose of detecting and correcting faulty systems. In addition, staff made 2,707 inspections of private sewage systems with regard to regulating the installation of septic tank and holding facilities in the District of Muskoka.

At the end of 1982 a sewage project was completed in the Town of Huntsville, to serve the Hidden Valley area. The project opened the area for development and relieved the concerns of citizens with regard to water quality in area lakes.

Staff dealt with six private systems correction programs in the Town of Caledon at Alton, the Township of Scugog at Manchester and Greenbank, the Town of Pickering at Claremont, the Township of Smith at Bridgenorth, and the Town of Newcastle at Newtonville.

Staff made 1,078 inspections of communal water and sewage works. In the case of sewage works, 501 inspections were made of sites receiving processed organic waste (digested sludge) from sewage works. The thrust of the program was towards meeting new guidelines for utilizing the material as a soil conditioner.

During the year, 1,046 inspections were made of communal waste sites. A new site was opened to serve the Town of Huntsville, which permitted the closing of the old site which lacked capacity.

The Environmental Appeal Board ratified an agreement between parties involved in a hearing on the closing of York Sanitation Site No. 4 in Whitchurch-Stouffville. The closing plan required completion of the site by 1985. A limit has been placed on the area to be used and the quantity of waste to be received.

A total of $101,000 was disbursed to 29 municipalities to make improvements to waste sites. They varied from fencing to facilities designed to prevent the off-site migration of methane gas.

Air Quality

The region maintained a network of 450 instruments to monitor air in 25 communities.

In Toronto, the significant improvements in air quality achieved during the 1970s were maintained.

The Toronto Air Pollution Index (API) exceeded the advisory level of 32 on four occasions. The maximum level reached was 54 on October 27, 1982.

The intensive lead monitoring program around secondary lead smelters and major lead users continued. Asbestos monitoring on an intermittent basis was carried out in Peterborough and Lindsay.

Radioactivity levels were monitored in the vicinity of the Pickering nuclear generating station and the Eldorado nuclear plant in Port Hope. Levels were generally similar to those monitored in downtown Toronto.

Fluoride surveys were continued around brick and glass plants in Toronto, Brampton and Mississauga.

Water Resources

The water quality monitoring program on Lake Simcoe continued. During the ice-free period, 11 lake stations, plus one on the lower Holland River, were sampled.

Staff conducted water quality assessments on Lakes Muskoka, Rosseau and Joseph within the

District Municipality of Muskoka. The Muskoka District Planning Unit, in co-operation with the region, carried out water quality assessments on an additional 34 lakes.

An overview water quality survey of the Nottawasaga River was conducted to identify problem areas which may require further study.

Water quality surveys were carried out on Mussleman's Lake and Lake St. George, and an aquatic macrophyte survey of Penetang Harbour was conducted.

Five investigations of possible water quality impairment related to industrial and municipal discharges and landfill sites were conducted.

The groundwater unit carried out environmental impact assessments of 60 abandoned, active or proposed municipal or industrial landfill sites and disposal sites. Complex and sensitive sites like Keele Valley (Maple Pits), Stouffville, Seymour Township, Regional Reclaimers Ltd. (Newcastle), are under ongoing assessment. Also investigated were 30 groundwater quantity and 85 quality interference problems (due to spills of hydrocarbons, other chemicals as well as to improper salt and road salt applications).

The region maintained stream water quality stations at 192 locations, as well as eight recording and 11 periodic streamflow stations, and 27 recording observation wells. The following conservation authorities assisted Ministry staff in the collection of water samples: Credit Valley, Halton Region, Metropolitan Toronto and Region and South Lake Simcoe.

Water Monitoring

Water quality stations (Assisted by MTRCA, Credit, Halton and SLSCA)	192
Streamflow	
Recording	8
Periodic	11
Observation wells	27
Self-help program	80
Water well location	
Records received	2,176
Records returned	1,486
Balance awaiting location	5,909

Utility Operations

The region provided water and/or sewage services to a population of 530,000 persons. An additional sewage treatment plant, under construction in the Township of Tay, will serve the village of Victoria Harbour and a portion of the township.

Approvals and Planning

Land-use plan review activities declined in the early part of the year, due to a decline in building activity. Environmental assessment activities increased over previous years, and a full-time environmental assessment co-ordinator was assigned. As well, the lakefill quality assurance program was established to monitor the quality of excavation material destined for use as lakefill in Lake Ontario.

The following outlines the review activities of the unit:

Plans of subdivision reviewed:	242
Official plans and amendments:	219
Quasi-approvals: (Niagara Escarpment Commission, Parkway Belt applications, Minister's zoning orders, etc.)	42

Seven major environmental assessments were reviewed, and 68 reports submitted under provisions of various class environmental assessments. Pre-submission consultations occurred on 25 projects.

Approvals staff issued 322 certificates of approval for industrial emissions to the atmosphere and nine certificates for emissions to water. Forty new permits to take water were processed, 51 previously issued permits renewed, and 29 letters of approval issued to authorize temporary water taking.

Southeastern Region

Director: R. E. Moore

Industrial Abatement

Regional staff investigated 603 complaints on environmental contamination and responded to 158 spills.

One control order was issued to Domtar Fine Papers requiring reduction in atmospheric emissions of chlorine, chlorine dioxide, and hydrogen sulphide, and reduction in suspended solids discharged to the St. Lawrence River.

A Section 42 order was served on O.E. MacDougall Liquids Waste Services and Systems Ltd. directing it to investigate leachate migration from a former waste disposal site property.

To upgrade emergency response preparedness, an emergency vehicle was outfitted with response and communications equipment. In addition, a comprehensive contingency plan, including nuclear contingencies, was developed for the region to replace individual district plans.

A co-ordinated provincial response with the ministries of Labour and Natural Resources was given to the proposed closeout approval plan of the Atomic Energy Control Board for the uranium mine operated by Madawaska Mines Ltd. at Bancroft.

A consultant was chosen to design and supervise corrective measures to remove/contain PCB contaminated soils in the vicinity of Lake Clear in Renfrew County.

Significant pollution abatement measures undertaken by industries in the region are the following:

- Phosphorus removal facilities were installed at Nestle Foods, Chesterville.
- An expansion of the lagoon system at Ault's Food, Winchester, resulted in a significant improvement in effluent quality.
- Pfizer Limited, Cornwall, began construction of an extended aeration effluent treatment system.
- Two Krofta clarifiers were installed at the Trent Valley

Paper Company to virtually eliminate any effluent discharge.
- Construction of a retention pond, berms, new leachate collection system and a new arsenic treatment plant at Deloro was effected at a cost of $1.6 million.
- A $400,000 baghouse was installed on the east side vacuum residue system at Chromasco, Hailey Station, reducing emissions by more than 99 per cent.
- A $250,000 filter press was installed by E.B. Eddy at Ottawa to dewater sludge in the millwaste waters, completing its control order.

Municipal and Private Abatement

The section worked with the following programs/projects:
- The Town of Amprior began a sewer separation program; total cost $2.5 million; Ministry grant $1.26 million.
- Construction began on the City of Pembroke water treatment plant; Ministry grant of $2.4 million.
- Work started on the force main from Richmond (Township of Goulbourn) to the Regional Municipality of Ottawa-Carleton system; Ministry grant $3.2 million.
- Replacing watermains and upgrading of the sewer system in Carleton Place commenced; Ministry grant $2.0 million.
- Work continued on the Napanee area water and sewage projects. In early 1983 the expansion of the sewage treatment plant to secondary treatment with phosphorus removal became operational; Ministry grant $1.5 million.
- A total of $80,000 was provided under the waste management improvement program to upgrade 18 waste disposal sites.
- An area study for waste management for the Town of Rockland and the Township of Clarence was completed under a 50 per cent grant. The report is being reviewed.
- An Environmental Assessment Board hearing under the EPA was held for the City of Cornwall's new waste disposal site and the board recommended approval. Final design of the site is in progress. $2 million was spent on 43 water and sewage projects under the private services funding program and a further 34 projects were approved for study.
- Approximately 1,000 complaints were investigated.
- There was an increase of 55 per cent in applications (800) for approval of private sewage systems along with a substantial number of requests for severances in the Ottawa area.
- In late 1982 a number of wells in the Lanark area were contaminated as a result of the Ontario Hydro fall herbicide spray program. The wells have recovered or are recovering.
- The demand for structural permits to control bats in dwellings in the Ottawa area remains high.

Air Quality

Highlights for this unit included:
- Sulphur dioxide (SO_2) monitoring at Hawkesbury was discontinued with the cessation of operations at Canadian International Paper.
- A trailer station for TRS monitoring was established near Courtaulds in the east end of Cornwall to complement the TRS monitor in the west end near Domtar.

Water Quality

Groundwater assessment staff carried out 51 groundwater contamination and 14 groundwater interference complaint investigations and completed assessments of the groundwater implications of 35 landfill, eight lagoon, 15 quarry and 52 sludge utilization sites. Office reviews and comments were completed on 133 planning documents pertaining to the region's groundwater resource. Ten water well level records were maintained.

Surface water assessment staff maintained water quality monitoring stations at 93 stream locations and on 79 lakes. Fifteen lakes were sampled in conjunction with the APIOS program. Thirty-nine water quality studies were undertaken to determine the impact of point source and leachate waste inputs to surface waters.

Reviews and comments were completed on 86 nearshore dredging and/or filling projects, 21 municipal services and five industrial waste treatment projects, 24 water taking permits and 38 agricultural drainage projects.

Utility Operations

The region operated 43 sewage projects, serving a population of 194,900, and 24 water projects serving a population of 56,800.

Approvals and Planning

This unit examined 85 official plans and amendments, 533 zoning by-laws, 95 subdivision plans, 14 consent applications. 139 applications for regional approval under Ontario's environmental legislation, 161 applications for head office approval under environmental legislation, 165 applications related to programs of other agencies and 108 environmental assessment documents.

The unit also monitored the Trans Canada Pipe Lines North Bay shortcut construction project, the environmental assessment for the Hwy. 416 corridor project, various land use planning projects, and Sutcliffe, Tricil and City of Kingston waste management and sludge activities.

A mobile air monitoring van has been obtained from Air Resources Branch and is being refurbished and provided with continuous monitors for SO_2 and oxidants. This vehicle will be based in Kingston, but will be available for spot surveys in other areas.

There was technical input into a new telemetry system and to electronic data processing systems in general.

Laboratory Services

The Kingston regional laboratory performed the same number of chemistry tests as in 1981/82 (106,000), and an increased number of microbiological tests (60,000).

The microbiology workload is predominantly drinking water supplies with special investigative projects (Aeromonas in Belleville) on problem systems.

Increased analytical support is being provided for landfill monitoring and for Ministry of Health programs such as prenatal and dental care.

Environmental Approvals and Project Engineering Branch

Director: C.E. McIntyre

Approvals functions of the former Environmental Approvals Branch and engineering expertise from the Project Co-ordination Branch were consolidated within one branch to enhance the Ministry's "one window approach" and permit a more effective use of staff.

The Environmental Approvals and Project Engineering Branch is now responsible for the review and processing of applications required under the Environmental Protection Act and the Ontario Water Resources Act. It is also responsible for promoting consideration of the environment in land use policies and programs, and for encouraging development of water supply and sewage treatment infrastructure through the provision of engineering and construction assistance to municipalities.

Approvals Section

Municipal and Private Approvals Unit

The unit processed 878 waterworks applications at a cost of $190 million and 1,152 sewage works applications at a cost of $327 million.

Industrial Approvals Unit

This section receives and processes industrial applications for the approval and control of facilities for contaminant discharges into the natural environment. The following chart summarizes this activity for 1982/83:

	Applications Processed			
	Received	Approved	Cancelled	Denied
Air	523	454	54	1
Water	91	70	29	1
Waste	0	0	0	0
Total	614	524	83	2

Waste Sites and Systems Unit

This unit processed 59 applications for waste management sites and 191 applications for waste management systems.

Staff participated in numerous meetings, technical evaluation and discussions with site owners, operators and multi-disciplinary consultants, the public and government agencies to assist in resolving technical and legal conditions for the certificate of approval for the Maple and Ridge landfill sites. In addition, there was extensive participation in negotiations to reach consent of all parties covering the interim operation and ultimate closing of the Whitchurch-Stouffville landfill site.

Project Engineering Section

The project engineering section handled 107 construction contracts and administered a capital expenditure of $72.2 million (see Table I). Of this amount, 30.6 per cent was paid out as subsidies under the Ministry's construction program for municipalities. In addition, the branch is responsible for the administration and budgeting of the Ministry's:

- Direct grant program for providing grants to assist the construction of municipally-owned water and sewage facilities (1982/83 expenditure $56.4 million).
- The grant program for repair and renewal of private sewage and water systems in small communities (1982/83 expenditure $4.7 million).
- Direct grant program under the joint job creation program of the Ministry and the Board of Industrial Leadership and Development (BILD) for providing grants to assist the construction of municipally-owned water and sewage facilities (1982/83 expenditure $3.4 million).
- Canada-Ontario Agreement Sewerage Program (COASP) for providing grants to assist the construction of sewerage facilities in the Great Lakes basin (1982/83 expenditure $35.0 million).

Central Ontario Projects

The construction of the water supply works for the community of Keswick, valued at $3.9 million, continued. The intake pipe to Lake Simcoe was completed and the treatment plant was approaching completion at year-end.

The water supply works for the Town of Wasaga Beach were placed

TABLE I
Volume of Activity Under Capital Construction Program
1982/83

1. Capital Expenditure		$72,233,000
Sewage works		$58,863,000
Waterworks		$13,370,000
Provincial projects		$71,323,000
Municipal projects		$ 910,000
Provincial subsidy		$22,133,000
% of total expenditure		30.64%
2. Construction – Ministry projects		
Contracts tendered	– Number	40
	– Value	$47,003,000
Contracts started	– Number	43
	– Value	$44,923,000
Contracts completed	– Number	42
	– Value	$63,642,000
Contracts under construction during the year		107
Average number of contracts under construction in each month		43
3. Construction – project management (Direct grant)		
Contracts tendered	– Number	26
	– Value	$16,693,000
Contracts started	– Number	32
	– Value	$19,125,000
Contracts completed	– Number	18
	– Value	$10,756,000
Contracts under construction during the year		36
Average number of contracts under construction in each month		15

TABLE II
Grants to Municipalities for Sewage Works and Waterworks
1982/83

1. MBR Priority Evaluations		
a) Direct grant programs requests		52
	– Ruled eligible	25
	– Rejected	27
b) Private systems program requests		23
	– Ruled eligible	20
	– Rejected	3
Total evaluated		75
2. Direct grant program payments (15 – 75% grants)		$56,379,000
3. B.I.L.D. grant program payments (15% grants)		$ 3,436,747
4. Private systems grant program payments (75% grants)		$ 4,687,000
5. Federal COASP grant payments		$35,000,000

in operation in June. An elevated water storage tank and connecting watermain are the only works program funded by the Ministry of Natural Resources. The remaining works are to be completed in 1983.

The sewage treatment plant and six sewage pumping stations for the village of Bobcaygeon were completed and the sewage system placed in operation. These works were the last of a $15.5 million water and sewage works program for the village.

Northern Ontario Projects

Projects in Northern Ontario continued to receive financial assistance from the Ministry of Northern Affairs to accelerate infrastructure development. Approximately $3.3 million was provided by Northern Affairs for direct administration by the branch to assist 20 of these projects.

Two subsidy agreements under the general development agreement of the Department of Regional Economic Expansion/Regional Priority Budget program continued to be administered by management committee which includes representatives from DREE, the Ministry of Northern Affairs and the branch project supervisor for the particular region.

The Northwestern Management Committee administers a $50.8 million program that includes sewage improvements in Thunder Bay and Ignace.

The Northeastern Management Committee administers a $30 million program that includes services for industrial parks in Parry Sound, Sudbury and North Bay, as well as infrastructure in Timmins. The DREE/RPB program also included expenditures for infrastructure projects for single-industry communities such as Nakina, Longlac, Geraldton, White River and Hornepayne.

York-Durham Projects

During the year, $19.5 million was spent on the York-Durham sewage system. The extension to Woodbridge was almost completed and final pumping stations in Newmarket and Aurora commenced. Final pipeline contracts in the system were awarded and began in the Aurora/Newmarket area.

At the Duffin Creek plant, the final major contracts involving the computer control system got under way.

More than $3.3 million was spent on the York Water System which was basically completed.

Value Engineering

Value Engineering, formerly the design and equipment section, received and evaluated for approval purposes design submissions received from consulting engineers for sewage and water projects. The submissions were evaluated from the viewpoint of sanitary engineering and cost-effectiveness, including energy utilization and conservation.

The section processed 96 submissions including major sewage and water projects in the South Peel Region, York Durham Area and Haldimand-Norfolk Region.

In addition, guidelines and standard specifications were designed for equipment.

Project Procedures and Control

This section develops, updates and implements criteria for the Ministry grant program. It also monitors expenditures for direct grant projects and provincial programs for sewage works and waterworks and advises on the scheduling of contracts to meet budget requirements. (See Tables I and II at the end of this section and Graphs I and IV in Appendices.)

Special Activities Section

Special Engineering, Design and Equipment

This unit investigates and develops solutions for unusual construction problems, prequalifies concrete sewer pipe plants, evaluates new products and develops technical guidelines, standards, and specifications for waterworks systems, equipment and construction.

Technical specialists are available to inspect new and operational sewage works and to advise on designs for new works and to carry out maintenance audits on Ministry plants.

Investigations of elevated water storage tanks built under Ministry projects were carried out and four tanks repaired. Interim water supply was provided to small communities during repair work. A survey of the condition of municipally-built concrete tanks was also completed. A total of 64 field inspections were made of Ministry water and sewage works projects.

The mechanical/electrical/instrumentation specialists made 678 field visits to water and sewage works projects.

Operational Services Group

The land-use group issued new, revised chapters to the Ministry's Land Use Plan Review Handbook, conducted seminars on land-use planning and prepared a new Municipal Environmental Planning Series publication to inform municipalities of land use planning.

In addition, the group participated in a water distribution and sewage renovation study for Ontario and in governmental committees and task forces on land-use related matters.

Noise Assessment Group

Expertise was provided to regional offices and municipalities in evaluating about 500 land-use proposals and development applications with respect to noise and vibration impacts and assisted in the investigation of noise and vibration complaints.

Private Sewage Group

This group examined new methods for delivering the private sewage program and revised the Manual of Policy, Procedures and

Guidelines for Private Sewage Disposal Systems to conform with metric standards.

Claims, Contracts and Engineering Audit

This unit reviews disputed claims and assists in settlements, arbitration or litigation arising from claims made in relation to water and sewage works projects financed or managed by the Ministry. In addition, the unit received tenders for construction for Ministry-managed water and sewer projects and provides engineering evaluations and inspections for Ministry-managed projects.

There were 67 tender calls for water or sewage projects and audits were carried out for 176 claims for grants.

Special Investigation Unit

Chairman, Supervisors Committee: M. G. McKenney

The Special Investigation Unit (SIU) began operations on January 19, 1981. The second full fiscal year of activities ended March 31, 1983.

Through the last report period, the SIU was composed of 13 permanent members: six supervisors, seven officers. All staff participate in enforcement activities.

Originally, the unit was to focus upon liquid industrial waste practices and in particular the waybill regulations. Moreover, the unit was to be an enforcement group which would co-ordinate and facilitate investigations, prosecutions, and the development of legal means of achieving abatement.

By the end of the second full year of operation, it had developed into a cohesive enforcement group. Staff had advanced significant initiatives in many areas of enforcement, and made the transition from abatement personnel to that of enforcement officers.

In co-operation with the Ontario Police College course at Aylmer, the SIU developed an improved Crown Counsel Brief form. These forms now commonly accompany requests to proceed with prosecutions and have been endorsed by Legal Services Branch.

The unit, in conjunction with Legal Services Branch, presented to senior management of the Ministry a proposal to streamline prosecution approvals. Subsequently, several hundred minor infractions of our legislation were "short-worded", thus allowing Provincial Offences Act "tickets" to be issued.

The ticketing program has proceeded cautiously as Provincial Officers are careful to assert their discretionary powers to lay charges. However, activity appeared to be increasing as fiscal 1982/83 ended. Included in this policy alteration was the ability for regional directors to authorize certain prosecutions, in concert with Legal Services Branch, where fines sought were less than $1,000.

As a spin-off of the Provincial Offences Act ticket program the SIU became involved in liaisons with boards of health. Individual health units administer Part VII of the Environmental Protection Act. Unit staff took part in training seminars for 15 health units. Further, staff, in co-operation with Legal Services Branch, co-ordinated the issuance of an improved identification package to designated health inspectors who are Provincial Officers under Part VII.

In addition to training health units in the intricacies of the Provincial Offences Act, staff initiated seminars for Ministry staff in each region. Forty-three legal training seminars were conducted.

The unit's activities have expanded to include a variety of other enforcement activities in the following fields:

- steel
- oil
- construction
- waste disposal
- paint
- automotive
- liquid wastes
- forest products
- pesticides
- transportation
- shipping
- agriculture
- minerals
- pulp and paper
- municipal water
- municipal wastes
- municipal sewage
- Federal facilities
- smelting
- pipelines
- gravel
- operations

The SIU was involved in over 600 investigations (Table 1). Of these, 62 cases were brought to court, resulting in 259 separate charges. Some $91,000 in fines resulted.

Statistics relating convictions directly to the number of charges laid can be misleading. The practice of proceeding with multiple charges, and then withdrawing some, complicates the analysis of litigation results. As described in Table 1, when withdrawals are eliminated from the analysis it can be seen that the success rate in charges handled by the unit was nearly 80 per cent.

The SIU has taken on a role of co-ordinating many court-related administrative duties within the regions. During 1982/83 it is estimated that more than 100 man-days of court appearances were made by unit staff.

The service of summonses and subpoenas and the swearing of information have also become roles often referred to SIU staff. During the report period, 328 summonses were served along with 161 subpoenas to witnesses. In addition, 11 search warrants were obtained and evidence siezed.

An essential aspect of the unit's work is developing a rapport with other enforcement agencies. During fiscal 1982/83 the following groups were contacted, assisted, or asked for assistance: Fuel Safety Branch, Ministry of Consumer and Commercial Relations; U.S. Customs; Canada Customs; Ministry of Labour; Ministry of Health; Environment Canada; Revenue Canada; municipal police departments; New York Department of Environmental Conservation; Michigan Department of Natural Resources; Ontario Ministry of the Attorney-General; Ministry of the Solicitor-General (Fire Marshal's Office); court administrators; Ministry of Natural Resources; OPP; RCMP; Ministry of Transportation and Communications; Department of Transport; Department of National Defence; Environment Alberta; Pennsylvania Department of Environmental Conservation; New Jersey Department of Attorney-General; New Jersey Department of Environmental Control; Massachusetts Environmental Control Board.

S.I.U. Activities – Fiscal 1982/83

Table 1

Prosecution activity (Cases begun 1982/83)

	Charges	Convictions	Dismissals	Withdrawals	Fines
Central	40	28	6	6	$30,000
West-Central	23	13	10	0	$ 4,000
Southwestern	52	21	1	30	$17,000
Southeastern	20	15	0	5	$ 5,520
Northwestern	13	7	2	4	$15,306
Northeastern	111	57	19	35	$19,641
Totals	259	141	38	80	$91,467

Table 2

Investigation activities (SIU Lead and Support)

Central	110	Southwest	190	Northwest	109
West Central	88	Southeast	78	Northeast	84

Total 659

Table 3

Involvement in abatement controls

Central

Provincial Officer demands	43*
Part V orders	4
	47

West Central

Part V orders	4
Minister's orders	3
	7

Northwestern

Part V orders (S41)	2
Minister's orders (S16)	2
Water Resources	1
	5

Southeastern

Part V orders	6
Minister's orders	3
Water Resources	2
	11

Southwestern

Control orders	3
Minister's orders (S16)	1
Part V orders	2
	6

Northeastern

Part V orders (S42)	1
Control orders	5
Water permits	1
Part VII orders	52
	59

Total 135*

Table 4

Training seminars offered (Health units and MOE)

Central	8	Southwest	14	Northwest	4
West Central	2	Southeast	8	Northeast	7

Total 43

*Does not include Provincial Officer demands (S127)

finance and administration division

Executive Director: G. E. Higham

This division provides a complete range of support services and control functions to the operating divisions required for the efficient operation of the Ministry.

It also manages the finances of the Ministry's water and sewage works.

Accounts Branch

Director: W. D. Wood

The accounts branch is responsible for the co-ordination of the financial management function of the Ministry and its related agencies, boards and commissions.

The branch carries out its responsibilities by ensuring systems and policies are in place to support program objectives and ensure compliance with central agency policies and guidelines.

The branch financial systems are designed to ensure integrity of financial data and meet central agency reporting requirements as well as to aid managers in the effective management of financial resources. Branch staff assist program managers by providing financial analysis and evaluation for in-year monitoring and control of budgetary performance.

Capital Financing and Revenue Branch

Director: C. D. Mialkowsky

The role of this branch is to provide financial management for the capital and grant programs and to control the receipt of revenues.

Water and Sewage Works

Financial management was provided for 774 projects under agreements with municipalities and industry. The following is an analysis of the financing of 485 term loan agreements and 289 provincially-owned works under service agreements.

Investment in water and sewage works as of March 31, 1983 (At cost less recoveries)

	$ Millions
Term loan agreements	
Waterworks	38.5
Sewage works	51.3
	89.8
Service agreements	
Waterworks	318.9
Sewage works	712.6
	1,031.5
Total Investment	1,121.3

In most cases, the water and sewage plants were also operated by the Ministry. The total plant operations expenditures for the fiscal year amounted to $62.2 million. The statutory and contractual activities in this area include: setting service rates (104 in 1982/83); maintenance of accounting records, the reporting of financial aspects of various water and sewage projects as required by agreements and legislation; assisting municipalities in implementing billing and collection procedures under various service and term agreements and assisting them in by-law reviews when requested. Gross revenue generated by these activities in 1982/83 amounted to $103.7 million.

Cost Sharing Agreements And Grants

Administration of claims under Canada/Ontario cost-sharing agreements resulted in reimbursements of expenditures of $35.0 million under the sewage facilities construction program and $0.8 million under the Great Lakes surveillance program.

Provincial assistance on projects under service agreement amounted to $46.1 million and grants to municipalities amounted to $67 million.

During the year, the branch was active in the development of revisions to the Ontario Water Resources Act to permit annual water and sewage service rate reviews on provincial projects and to recover costs on these projects on a basis other than a gallonage basis.

Management Audit Branch

Director: E. F. Heath

The Management Audit Branch is a central support function responsible for providing management with assurance that control processes are satisfactory with respect to efficiency, economy and effectiveness or that improvements are necessary. These control processes encompass both financial and management controls under which Ministry programs and activities are administered.

With the introduction of the comprehensive auditing concept, approved by the central agencies in late 1980, the branch has embarked on a program to develop and implement this approach.

In order to cope with the added responsibility and more complex work load, staff was increased from seven to nine during the year and three more are expected to join the branch in July 1983.

The branch has performed some 180 audits on three grant programs, the Canada Ontario Agreement Sewage Program (COASP), the Up-Front or Direct Grant program and the Private Systems Grant program. The amount of construction cost on the claims audited for the fiscal year was $229.3 million.

Human Resources and Personnel Development Branch

Director: R. E. B. Burns

This branch assists and advises on all aspects of personnel management and development.

The branch held two career development assessment centres for non-professional staff. With the assistance of staff from the Ministry and from other ministries, candidates were assessed on their performance in a simulated role.

Within the program to enhance the management capabilities of staff, the branch conducted eight classification grievance workshops, five position specification writing workshops as well as two management development courses.

The training and certification section ran 52 technical courses for 491 Ministry staff and 647 non-Ministry staff. Included were 116 students from industry, 20 from out of the province and seven from outside Canada.

The number of employees in the computerized manpower planning inventory was increased. This now allows employees to identify their career aspirations in a manner which enables management of the Ministry to plan future staffing activity.

Work commenced on the development of an attendance improvement program. The full program will be implemented in 1983/84.

Office of Administrative Services

Manager: A. E. Robinson

This office provides purchasing, accommodation, records management, printing, and office support services to this Ministry, and ensures compliance with government administrative policies and procedures.

The purchasing section is responsible for the purchase of all supplies, equipment, and services totalling approximately $47 million.

During the year, the major task of the accommodation section was co-ordinating the consolidation of various branches and sections of the Ministry which were affected by the re-organization in 1982/83.

This office also provides assistance to Ministry clients in the administration of such records management programs as the retention and disposal of records, the design, procurement and distribution of Ministry forms, the feasibility of acquiring microfilm and word processing equipment.

This office co-ordinates the acquisition of printing services for Ministry clients in the most economical and efficient manner either through in-house facilities or outside vendors.

Systems Development Office

Manager: G. Scanlon

The role of this office is to provide developmental and operating support for the Ministry's computerized information systems.

Following is a brief summary of some of the projects:

- The feasibility study of the new air quality telemetry system involving the acquisition of computer equipment, software, data loggers and telecommunication facilities and services was completed.
- The feasibility study on the new industrial waste waybill system involving the acquisition of computer equipment and software was completed.
- The development of the waste information system was completed. The entering of field data and approvals data describing waste sites began.
- A second HP3000 computer was acquired for the Laboratory Information System (LIS) to act as an input/output processor in order to improve sample submission processing, system response times and report turnaround. Implementation of the first Direct Computer Input (DCI) application was completed involving eight micro computers, resulting in a significant reduction in time spent by technicians entering results data.
- The acquisition of a computer system for the Northeastern regional office in Sudbury and district offices in North Bay, Timmins and Sault Ste. Marie was completed. The regionalization of four of the six systems selected in the Regional Distributed Data Processing System (RDDPS) was completed:
  - Sample Information System (SIS)
  - Air Quality Information System (AQUIS)
  - Industrial Monitoring Information System (IMIS)
  - Industrial liquid waste waybill system
- The development of the Industrial Monitoring Information System (IMIS) was completed. The entering of data and the build-up of master files will take place in the new fiscal year.

The system operations section was involved in processing approximately 30,000 jobs and providing information centre services such as training for users in retrieval languages and the use of statistical packages.

boards and committees

The Environmental Assessment Board

Chairman: B. E. Smith

The Environmental Assessment Board is an independent administrative tribunal which reports to the Legislature through the Minister. It conducts public hearings on environmental issues under the following legislation (the number of hearings which took place during the 1982/83 fiscal year being indicated after each act in parenthesis):

The Ontario Water Resources Act (15)
The Environmental Protection Act (7)
The Environmental Assessment Act (1)
The Consolidated Hearings Act (8)

Following hearings held under the former two pieces of legislation, the board forwards a recommendation with respect to the hearing to the director of Environmental Approvals and Project Engineering Branch. Under the latter two pieces of legislation the board issues a decision (the issuing of such decision under the Consolidated Hearings Act being in conjunction with the Ontario Municipal Board).

At the end of 1982/83, the board had 18 members, four of whom, including the chairman, are full-time members.

The board publishes its own annual report which is available from the board's office at 1 St. Clair Avenue West, Fifth Floor, Toronto, M4V 1K7. (Telephone: 416/965-2531).

The Environmental Appeal Board

Chairman: L. C. De Groot

The Environmental Appeal Board is an independent administrative tribunal which reports to the Legislature through the Minister. Established under the Environmental Protection Act, it provides an appeal mechanism for persons affected by certain decisions made by the Ministry or by local health units. The board consists of 13 part-time members, including the chairman, appointed from various parts of the province, and different occupations.

In 1982/83, the board received 37 appeals. Approximately 38 per cent concerned decisions of local health units on private sewage systems. The remaining appeals resulted from Ministry decisions regarding waste disposal sites, waste management systems, private sewage systems, waterworks and air pollution control.

The board held 33 days of hearings. It resolved 27 of the appeals received during the year as well as nine appeals from the previous year. Two appeals from the previous year remain in abeyance. At year-end, decisions remained to be issued, or hearings held, on 10 appeals.

The Pesticides Advisory Committee

Chairman: Dr. G. S. Cooper

Established under The Pesticides Act, 1970, the Pesticides Advisory Committee annually reviews the act, its regulations and government publications concerning pests and pesticides. The committee also enquires into matters concerning pesticides and the control of pests as deemed necessary or as prescribed by the act and regulations.

The committee recommended several minor changes to Ontario Regulation 751, evaluated the environmental impact, toxicity and hazard of three new pesticide active ingredients and 210 newly registered pesticide products including 74 fertilizer products containing pesticides, and recommended for each a classification for storage, sale and use. Seven obsolete products declared by the registrants to be no longer available were recommended for removal from the active list of scheduled products. The Ontario guidelines for classification of pesticide products were updated in May 1982.

The committee continued a research program established in 1973 with three major objectives:

- To find alternative pesticides for those deemed environmentally hazardous and those restricted in use.
- To determine potential environmental hazards with pesticides currently in use.
- To reduce pesticide input into the environment.

Forty-six research proposals were received, of which 28 were funded by the Ministry at a cost of $296,625. A two-day research symposium was held in January 1983 at which grant recipients reported on their findings. An annual research report is published.

Seventeen committee meetings were held and scientific reviews were carried out. The following reports were released:

- A Scientific Update On the Current Status Of Tordon (Picloram) Herbicide
- Carbaryl — An Overview
- Paraquat — An Overview
- Acephate and Methamidophos

All provincial publications dealing with pesticides were reviewed.

Farm Pollution Advisory Committee

Chairman: O. Crone

Consisting of four farmers, this committee provides objective assessments of farm environmental situations as requested by Ministry officials. The committee visits farms to investigate complaints and make recommendations concerning manure storage and spreading, cultivation, yard drainage and ventilation of livestock and poultry buildings.

In 1982, the committee investigated three cattle feed lots.

crown agency

Ontario Waste Management Corporation

Chairman and President:
D. A. Chant

The Ontario Waste Management Corporation (OWMC), established as a Crown agency in July 1981, reports to the Legislature through the Minister of the Environment. The corporation's prime responsibility is to design, construct and operate a province-wide system for the treatment and disposal of liquid industrial waste and hazardous waste, and to develop a long-term program to assist in the reduction and recycling of such wastes.

Two phases were completed of a five-phase facilities development process, designed to prepare detailed proposals on appropriate technologies and sites for a liquid industrial waste system. In September 1982, a Phase 1 Report was issued, containing estimates on the amount, type and location of liquid industrial waste produced in Ontario; information on appropriate world-wide treatment technologies; and important geological/hydrogeological, environmental, engineering and land-use information required to begin assessing treatment and location options.

In January 1983, a Phase 2 Report was issued, containing a refinement of data collected during Phase 1, preliminary planning guidelines on the type of system to be developed, the selected geological region where the search for suitable sites would be concentrated, and a proposed methodology for site selection.

OWMC officials held 225 meetings with groups, individuals and associations to discuss the Phase 1 and 2 Reports. Meetings were held in Sarnia, Chatham, London, Hamilton, St. Catharines, Oshawa, Richmond Hill, Brampton and Toronto, where 76 groups and individuals discussed the two reports with OWMC officials.

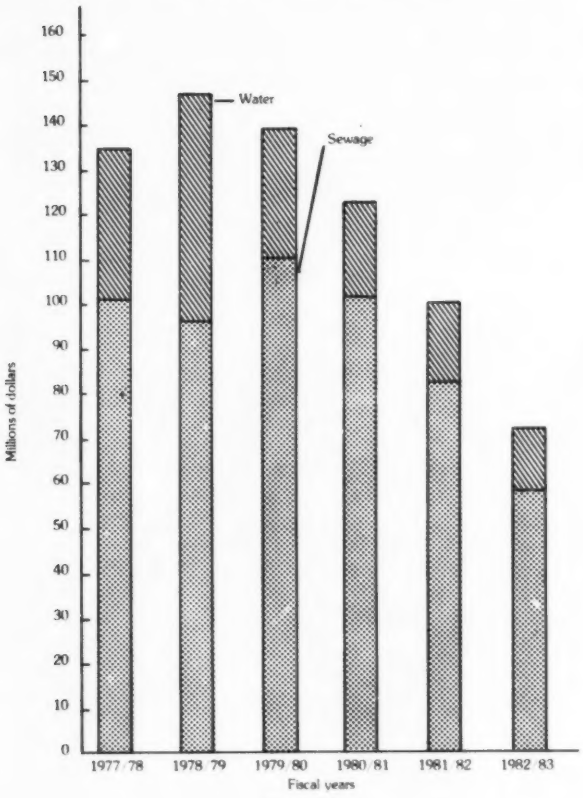
Seminars were also scheduled to discuss planning issues in more detail; six one-day conferences were scheduled throughout Southern Ontario for municipal officials in conjunction with the Association of Municipalities of Ontario, and a weekend meeting was held in February with representatives from 25 associations to discuss the site selection process.

The OWMC submits an annual report to the Minister of the Environment dealing with its activities, which is available through the agency's offices at 2 Bloor St. East, Toronto, M4W 3E2.

appendices

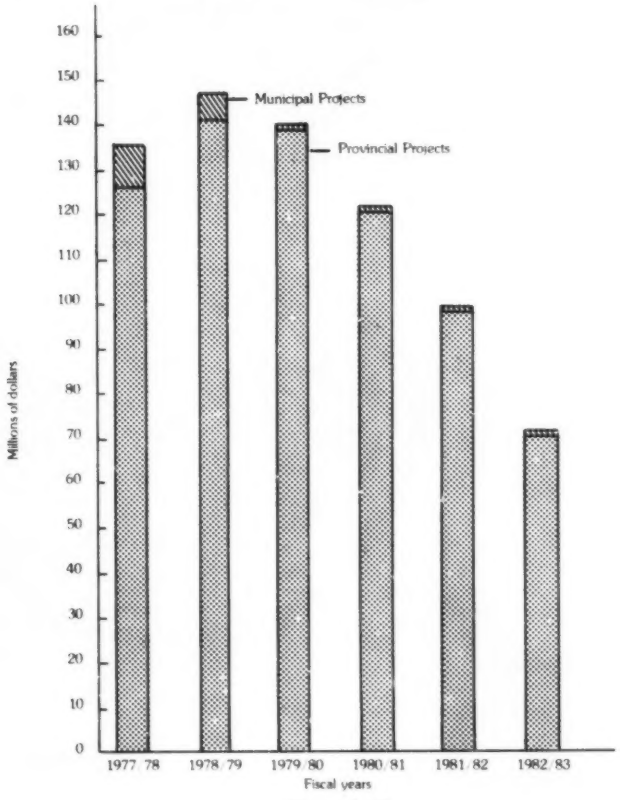
CAPITAL CONSTRUCTION PROGRAM

Annual Total Expenditure by Project Type (1977/78 – 1982/83)



Graph 1

Annual Total Expenditure by Class (1977/78 – 1982/83)



Graph 2

Annual Total Expenditure by Project Type

Fiscal Year	Sewage	Water	Total* ($ Millions)
1972/73	54.4	26.0	80.4
73/74	68.4	13.1	81.5
74/75	94.8	32.0	126.8
75/76	114.8	40.1	154.9
76/77	114.8	31.2	146.0
77/78	101.0	34.1	135.1
78/79	96.6	50.7	147.3
79/80	110.6	28.9	139.5
80/81	101.9	21.7	123.6
81/82	82.9	16.6	99.5
82/83	58.8	13.4	72.2

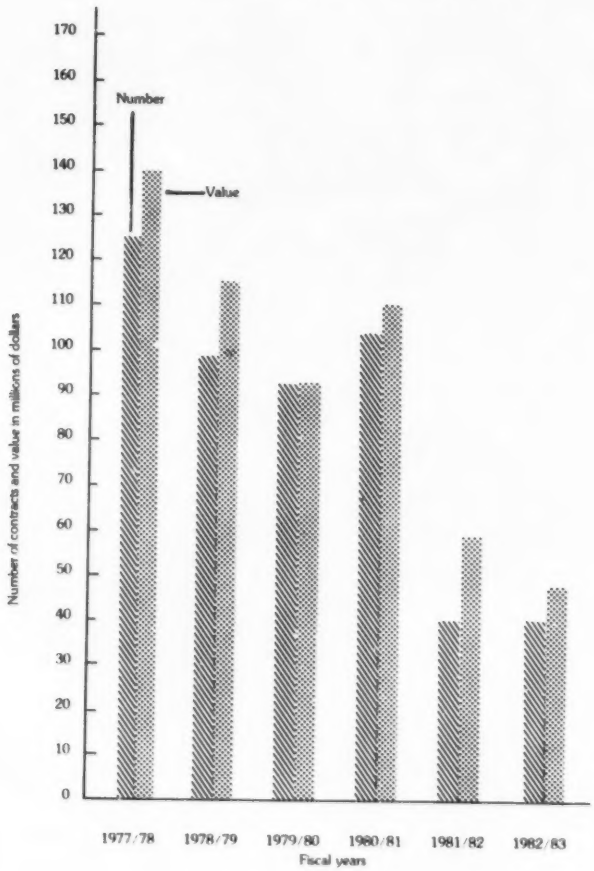
Annual Total Expenditure by Class

Fiscal Year	Provincial Projects	Municipal Projects	Total* ($ Millions)
1972/73	77.6	2.8	80.4
73/74	75.5	6.0	81.5
74/75	115.4	11.4	126.8
75/76	145.2	9.7	154.9
76/77	131.8	14.2	146.0
77/78	127.0	8.1	135.1
78/79	142.9	4.4	147.3
79/80	138.3	1.2	139.5
80/81	121.7	1.9	123.6
81/82	98.0	1.5	99.5
82/83	71.3	0.9	72.2

*Includes costs of engineering, property and miscellaneous items as well as contract prices.

CAPITAL CONSTRUCTION PROGRAM

Number and Value of Contracts Tendered Annually (1977/78 – 1982/83)

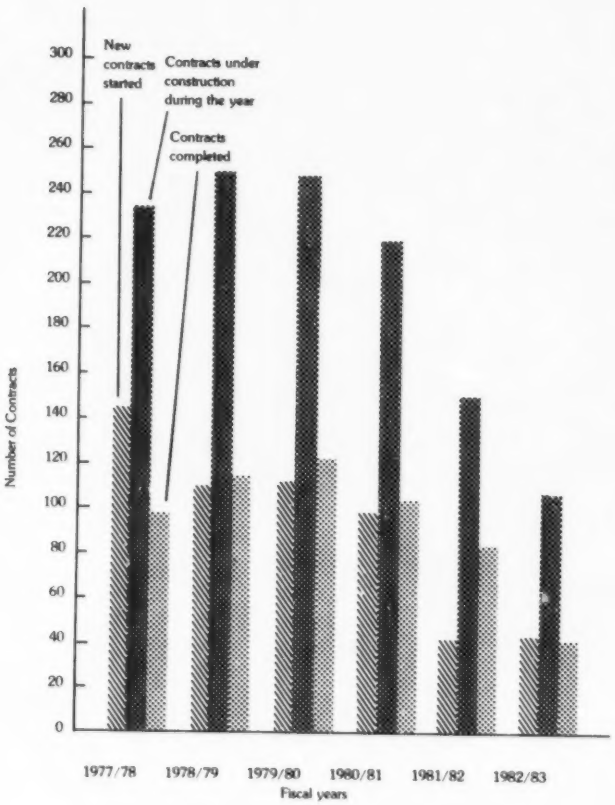


Graph 3

Number and Value of Contracts Tendered Annually

Fiscal Year	Number	Value ($ Millions)
1972/73	99	72.4
73/74	108	91.3
74/75	92	84.1
75/76	153	167.6
76/77	84	79.6
77/78	125	140.5
78/79	99	116.3
79/80	93	93.0
80/81	104	110.2
81/82	40	58.7
82/83	40	47.0

Annual Volume of Activity (1977/78 – 1982/83)

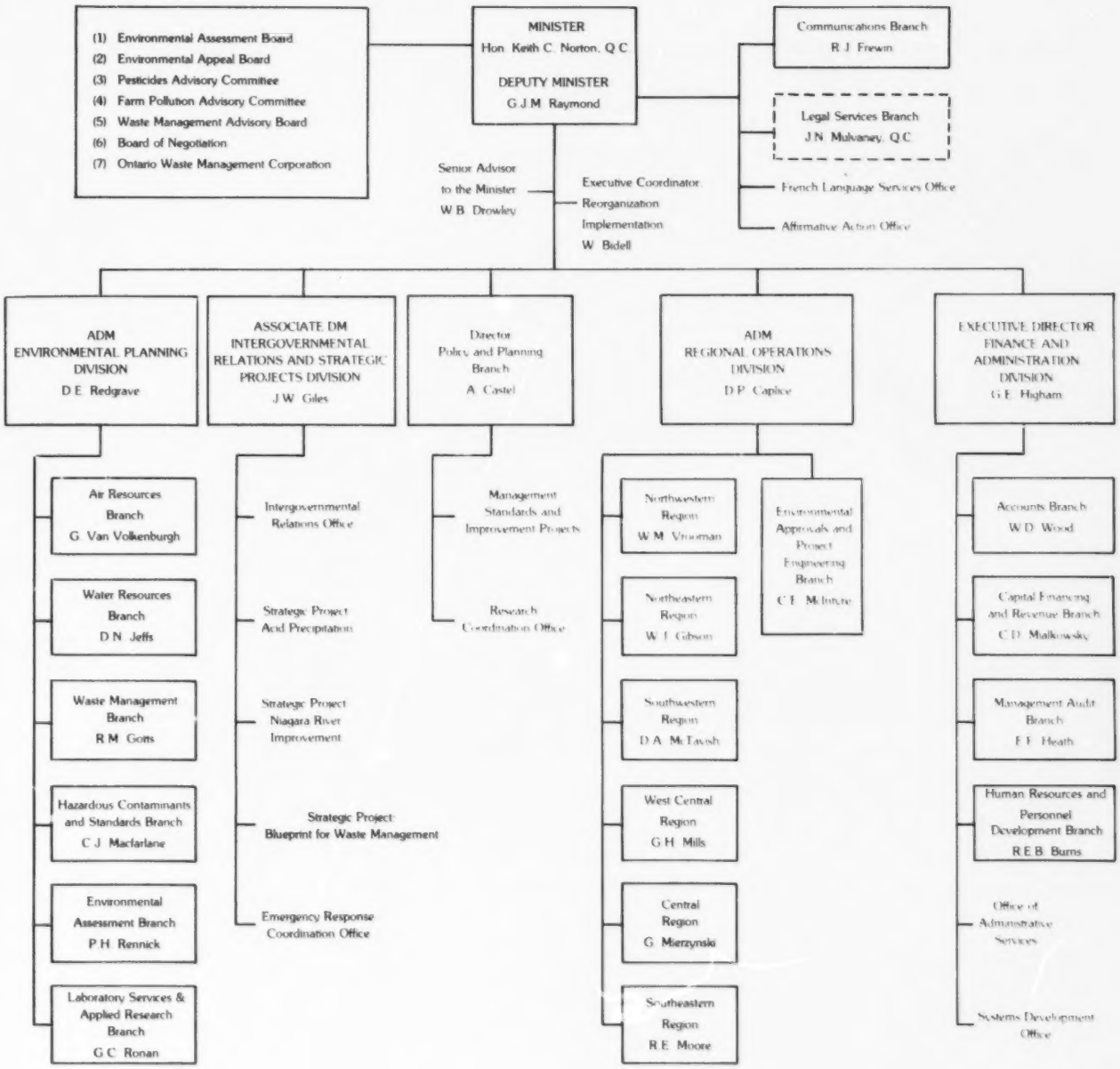


Graph 4

Annual Volume of Activity (Number of Contracts)

Fiscal Year	Started	Under Construction	Completed
1972/73	88	166	92
73/74	108	182	82
74/75	102	202	93
75/76	153	262	139
76/77	92	215	124
77/78	145	236	96
78/79	109	249	115
79/80	110	244	122
80/81	97	219	113
81/82	43	149	85
82/83	43	107	42

MINISTRY OF THE ENVIRONMENT — 1983*



*For Organization Chart, 1984 see inside front cover